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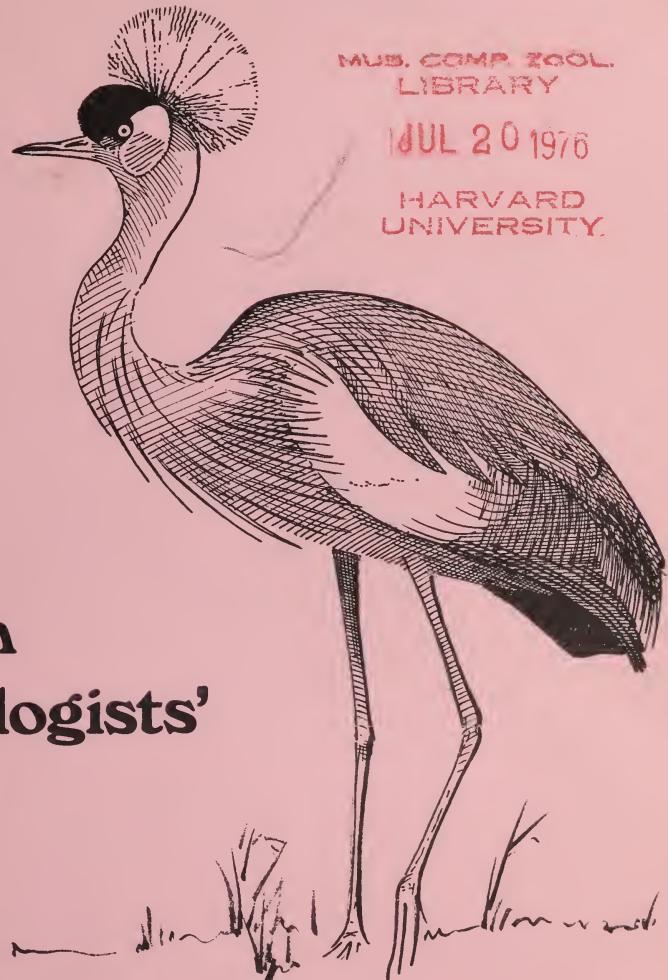


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# **Nigerian Ornithologists' Society**

**BULLETIN**  
**Vol. 12 No. 41 May 1976**

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THE NIGERIAN ORNITHOLOGISTS' SOCIETY

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The Society was formed in 1964 to link bird observers in Nigeria in the furtherance of the country's ornithology through the publication of the BULLETIN. Applications for membership are welcomed. Annual membership subscription rates (1976) ₦ 2.50 or £2.00.

Members receive the BULLETIN free of charge

CONSTITUTION

No comments or criticisms about the Draft Constitution as published in Vol.11 (1975) pp. 45-47 having been received, the Constitution has been formally adopted and became effective on 1st January 1976.

# Nigerian Ornithologists' Society

## Bulletin

Vol.12 No.41 , May 1976

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### CHAIRMAN'S NOTICE

All too often it falls to my lot to say an inadequate 'thank you' to some-one leaving Nigeria who has given outstanding help to the Society. It is now the turn of Jo Heigham, who has for years assisted ably the Honorary Secretary and Treasurer. After many years in West Africa he seems to have said goodbye to Nigeria; I say 'seems', because I have previously written here about Hilary Fry and Bob Sharland when they left Nigeria, but both are still very much in action on the Society's behalf. One knows that Jo will not lose touch, and he might even find his way back to Nigeria again : overtures are being made for his services by Zambia and Iran, but who knows ?

Jo Heigham and his wife Phyllis first came to Nigeria in 1958, having already spent 14 years in Ghana. They were in Ibadan for four years at a time when I was there myself, although we never met! I think they heard me address the Field Society and found me such a bore that they steered clear. They say now that they were only beginners and too shy to bother me - an unlikely tale! From 1962 to 1967 they were in Britain but returned to Lagos for the next six years. During that period I spent six months at Lagos University and not only did we meet at last but enjoyed a good deal of birding together, when I learned a great deal from him. For the last two years the Heighams have been based on Sapele and that is when Jo made his great contribution to the Society. We are all greatly indebted to him for his useful pamphlet 'Comparative Nomenclature of Nigerian Birds for the Amateur' (produced, incidentally, at his own expense), and also for helping to keep interest in the Society alive during the period when the irregular appearance of the Bulletin very nearly sounded its death knell. An important paper on the birds of Mid-Western Nigeria will appear in the next number of the Bulletin.

The Society is most grateful for all you have done, and we would like to wish you good fortune in your quest for new fields to conquer; may you yet return to Nigeria!

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### SUBSCRIPTIONS

The Committee regrets that under Rule II (2) individual and corporate membership dues for the current year have to be raised to ₦ 2.50 or £2.00. 1976 subscriptions are now due and should be paid either direct to the Society's account at Lloyd's Bank, Ringwood, Hants, U.K. or to the Treasurer at P.O. Box 342, Kano, Nigeria. The Treasurer would be grateful if those members who have already paid by Bankers' Order at the old rate would now pay the difference by amended Bankers' Order; a form for the purpose is enclosed.

## THE EVOLUTION AND SYSTEMATICS OF THE PHOENICULIDAE

by N.C. Davidson

Received 30 October 1975

## INTRODUCTION

The problems inherent in elucidating the evolution and affinities of a uniform family such as the wood-hoopoes (Phoeniculidae) are great, and there has been considerable dissent about their taxonomy, one to three genera having been recognised. Geographical distribution as an indicator of affinity together with plumage, mensural, ecological and behavioural characters permit a reappraisal of the group using a wide range of information (Fry 1969). This paper is limited to an appraisal of affinities within the Phoeniculidae and does not attempt to relate its affinities within the Coraciiformes.

Localities have been taken from skins in the collection of the British Museum (Natural History), Tring, and abstracted from the literature. They have been point plotted in Figs. 3-5, allowing detailed examination of distribution patterns using the methods of Hall & Moreau (1970). Data on ecological and behavioural characters from the literature are considered in conjunction with geographical distribution where they appear relevant to systematics.

## CHARACTERS

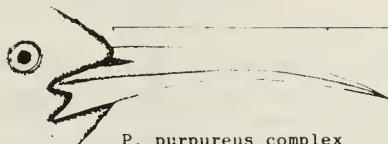
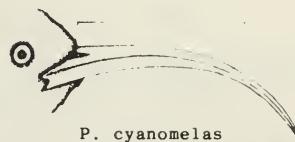
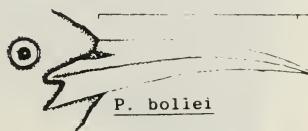
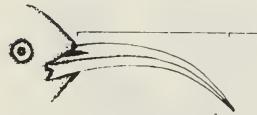
The taxa of wood-hoopoes recognised by White (1965), Peters (1945) and MacKworth-Praed & Grant (1957, 1962, 1970) are listed in Table 1. All wood-hoopoes inhabit wooded savannas except P. bollei and P. castaneiceps which are forest species.

Most accounts (e.g. Mackworth-Praed & Grant op. cit., Bannerman 1933, Bates 1930, Clancey 1964 and Roberts 1940) list three genera. The generic distinctions appear to have been overall size, bill morphology, and leg and foot colour (Fig. 1; Table 2). Phoeniculus comprises species with heavy, slightly decurved bills and red feet, whilst both Scoptelus and Rhinopomastus are small with black legs and feet. The last two genera differ in bill shape, Scoptelus with a short straight bill and Rhinopomastus long and greatly decurved (Fig. 1).

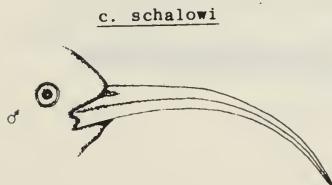
The monogeneric classification by White (1965) suggests greater uniformity and mostly follows Peters' (1945) scheme.

At subspecific level taxonomic characters are variation in iridescence, bill colour, presence or absence of white in wings and tail (Fig. 2) and measurements. Some subspecies are poorly defined and variability within widespread ones like P. p. marwitzii is considerable.

Juveniles of all species show greater similarity than do their adults, because of reduced iridescence and all-black bills.

a). ♂ Phoeniculus spp.P. purpureus complexP. cyanomelasP. bolleiP. minorP. aterrimusP. castaneiceps

Scales indicate length ranges

b). Sexual dimorphism in P. cyanomelasc. schalowic. cyanomelas

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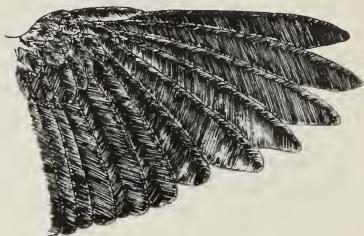
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Figure 1. Bill morphology of the Phoeniculidae

Wing with white 1<sup>o</sup> bar (e.g. purpureus  
complex, aterrimus)



Wing wholly dark and glossy  
(e.g. castaneiceps, bollei)



Tail long and graduated with white spots (e.g. purpureus complex,  
some cyanomelas)



Tail long and graduated lacking white spots (e.g. castaneiceps,  
bollei, minor)



Tail short and square (aterrimus)



(not to scale)

FIGURE 2. Plumage characters of the Phoeniculidae

THE P. purpureus COMPLEX :

P. purpureus, P. somaliensis, P. damarensis. Fig. 3

These large forms live in a wide range of savanna habitats occupying the whole of sub-Saharan Africa except desert and forest. Their plumage is dark and is usually iridescent brassy green, duller and bluer in West Africa, and duller and more purple in Ethiopia and Somalia. The bill is red except in Mauretania and Ethiopia/Somalia where it is partly or wholly black.

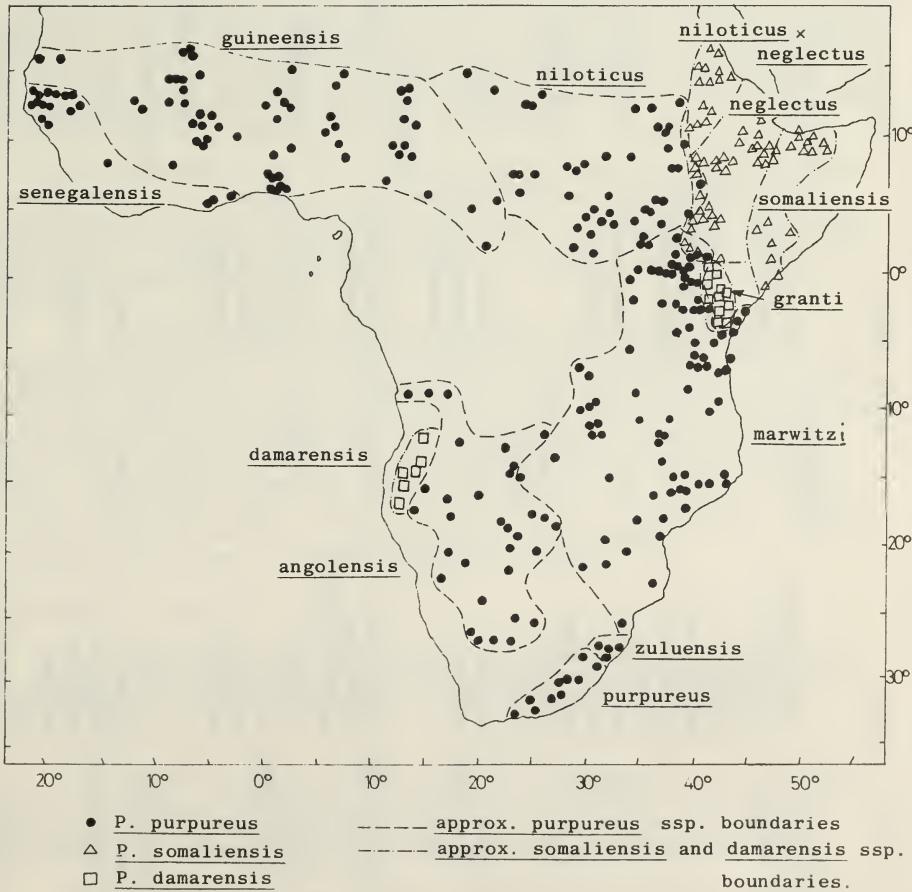


FIGURE 3. Distribution of P. purpureus, P. somaliensis and P. damarensis

Table 1. Classifications of the Phoeniculidae

Peters (1945)	White (1965)	Mackworth-Praed & Grant (1957, 1962, 1970)
<i>Phoeniculus</i> purpureus (Müller)	<i>Phoeniculus</i> purpureus	<i>Phoeniculus</i> purpureus
erythrorynchus		purpureus
angolensis		angolensis
zuluensis		
marwitti		marwitti
senegalensis		senegalensis
guineensis		guineensis
niloticus		niloticus
somaliensis		somaliensis
neglectus		neglectus
abyssinicus		abyssinicus
purpureus		
granti		damarensis
bollei	bollei	damarensis
(Hartlaub)		granti
Jacksoni		
		bollei
		jacksoni
		okuensis
castaneiceps	castaneiceps	<i>Scopetulus</i>
brunneiceps	brunneiceps	castaneiceps
(Sharpe)		brunneiceps
adolfifrederici		
aterrimus	aterrimus	aterrimus
(Stephens)		
emini		emini
notatus		notatus
archietae		archietae
		cavei Macdonald
<i>Rhinopomastus</i>		<i>Rhinopomastus</i>
minor	minor	minor
(Ruppell)	sonalicus	
	cabanisi	
	extimus	
<i>cyanomelas</i>	<i>cyanomelas</i>	<i>cyanomelas</i>
(Vieillot)	schalowi	schalowi

P. damarensis occurs as two distinct populations: d. granti in north-east Kenya and south-west Ethiopia, and d. damarensis on the Damaraland Plateau of South West Africa. White (1965) lists them as conspecific and adds that they are probably conspecific with P. purpureus. P. damarensis inhabits drier regions than P. purpureus and is restricted to Acacia woodland (Moreau 1966), whilst P. purpureus ranges over more thickly wooded savannas and is especially associated with riparian forest and palms. Moreau suggested that at a period of a little over 10,000 years ago P. damarensis had a nearly continuous range, but with subsequent reduction of Acacia steppe the range fragmented leaving two populations separated by the more habitat-tolerant P. purpureus. P. d. granti is smaller than damarensis and is also more glossy, more blueish purple and has a partly black bill, whilst damarensis is generally dull black with a wholly red bill. In view of the range of variation of P. purpureus, these differences are probably not sufficient for the two populations to be regarded as separate species.

There is some sympatry between d. granti and p. marwitzii in north-east Kenya but no evidence of hybridization; nor does d. damarensis interbreed with the parapatric p. angolensis. P. damarensis and P. purpureus must therefore be seen as separate species. Reproductive isolation between d. granti and p. marwitzii will be aided by their different habitats.

P. somaliensis has a black bill in both races somaliensis and neglectus, the bill of the latter being shorter and thicker (Table 2a). Like the other arid forms (P. damarensis), they both have dull plumage. White's (1965) opinion was that a third subspecies abyssinicus consists of hybrids between s. neglectus and p. niloticus, plumage and dimensions being intermediate. P. s. neglectus is sympatric with p. marwitzii and p. niloticus around Lake Turkana (L. Rudolf) and southern Ethiopia. These populations appear sympatric contemporaneously and must be regarded as separate species. P. somaliensis and P. d. granti behave as good species in their zone of contact in central Kenya.

#### P. bollei. Fig. 5

P. bollei inhabits both lowland and montane forest, and has rather a patchy distribution owing to the fragmentary nature of its habitat. The subspecies vary in the amount of white on the head and in size (Table 2b).

The main differences between bollei and purpureus are the smaller size of bollei, its white head and the lack of white on wings and tail. The voice is similar to that of purpureus - a prolonged chattering - although it is quieter and more resonant in bollei (Chapin 1939).

Whilst parapatric over much of its range due to habitat differences, bollei appears sympatric with purpureus in both West and East Africa.

P. aterrimus AND P. cyanomelas. Fig. 4

These are small forms, wing mean being c. 40 mm less than purpureus (Table 2c). Both aterrimus and cyanomelas inhabit savannas, generally occupying more arid regions than purpureus although there is considerable overlap. Like purpureus, they have dark glossy plumage, iridescence being predominantly violet and steel blue. All forms have a white wing bar, but vary in white subterminal spots on the rectrices. P. aterrimus has a shorter and less graduated tail than cyanomelas (Fig. 2). The bill of cyanomelas is typically long and greatly decurved, whilst aterrimus has a short straight bill (Fig. 1). For this reason they have often been distinguished generically (Mackworth-Praed & Grant 1957, 1962, 1970, Chapin 1939) as Rhinopomastus cyanomelas Vieillot and Scop-telus aterrimus Stephens. There is also a difference in calls (Table 2c). S. cavei (Macdonald 1946) is best included in aterrimus. P. cyanomelas occurs in south and east Africa and aterrimus occupies much of the remaining savanna. Their combined distribution is roughly equivalent to that of the purpureus complex.

There is some degree of sympatry between aterrimus and cyanomelas, White (1965) noting that they are barely sympatric in Zambia and Angola. Benson & Irwin (1965) have shown a region of hybridisation between a. anomalus and c. schalowi in western Zambia. From this they conclude that aterrimus and cyanomelas are conspecific, and there is almost a continuous range of bill shapes from the typical cyanomelas to the typical aterrimus form (Benson et al. 1971). Any sympatry in northern Kenya is very slight and aterrimus and cyanomelas are probably parapatric there. If there is limited sympatry, differences in voice and feeding ecology (as apparent from the bill morphology) may maintain segregation : schalowi has the most decurved bill of the group.

P. minor. Fig. 5

Like P. cyanomelas and P. aterrimus, this is a small species, very like cyanomelas with which it is united in Rhinopomastus by Peters (1945). P. minor occupies the arid bush regions of Ethiopia, Somalia and northern Kenya and is extensively sympatric with both P. aterrimus and P. cyanomelas. P. m. minor and P. m. cabanisi intergrade over much of their range, subspecific differences being in size and white tail spots (Table 2d). P. m. minor resembles P. cyanomelas in the decurved bill, although it is orange in adult minor and black in adult cyanomelas : the bills of juveniles of both species are black.

In the zone of sympatry there appears to be interspecific divergence in plumage pattern : m. cabanisi has neither the white wing bar nor the white tails spots of the sympatric c. schalowi - for these highly mobile species this may be an important means of segregation. The sympatric a. emini and m. minor lack these plumage differences but the bills differ markedly and segregation by feeding ecology probably results.

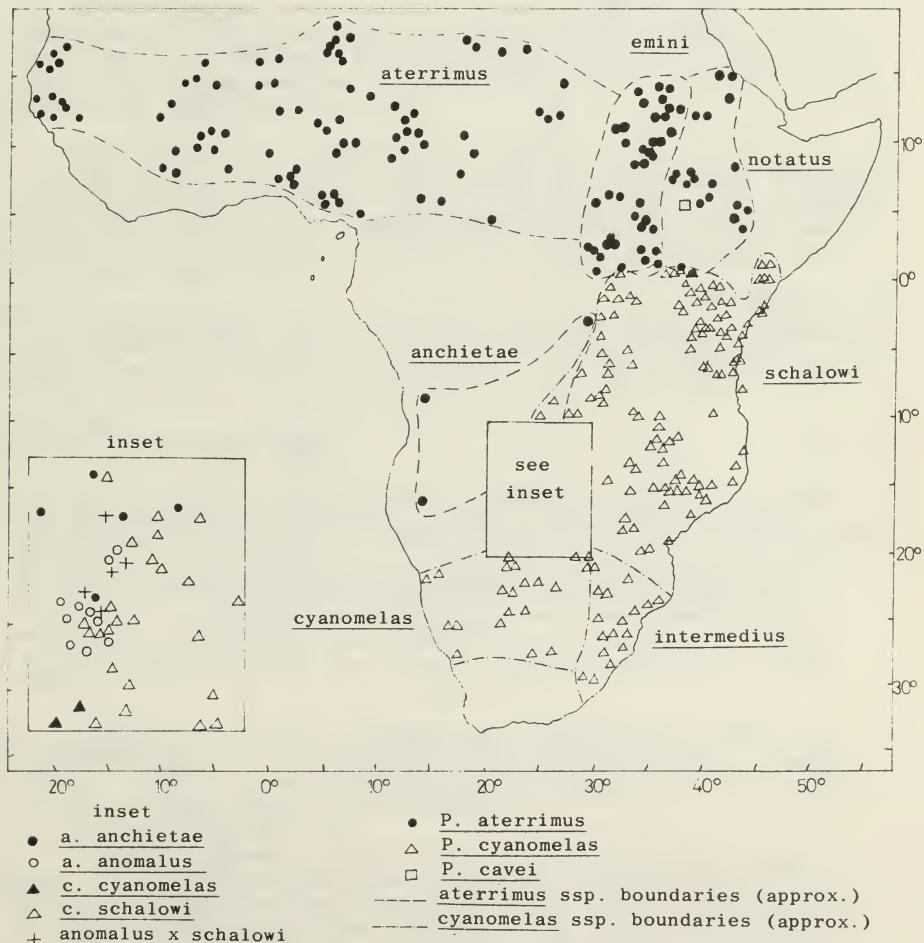
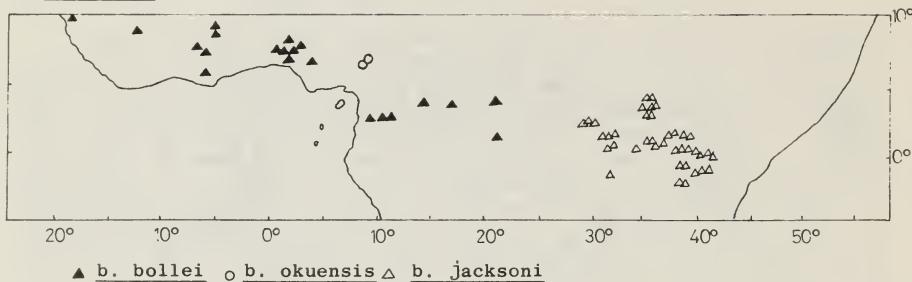
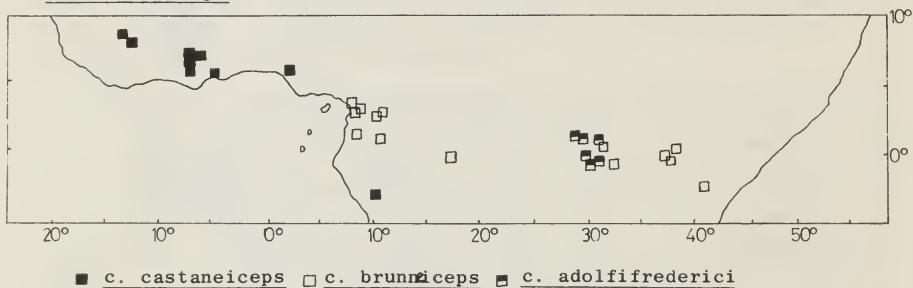
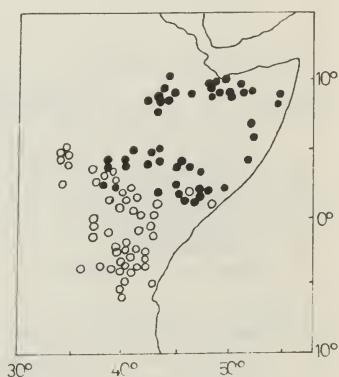


FIGURE 4. Distribution of *P. aterrimus* and *P. cyanomelas*

a) P. bolleib) P. castaneicepsc) P. minor

- m. minor
- m. cabanisi

FIGURE 5. Distribution of P. bollei, P. castaneiceps and P. minor

P. castaneiceps.

## Fig. 5

P. castaneiceps is essentially a bird of secondary growth and forest edge. It is rather secretive, and records are sparse. Smaller than P. bollei (Tables 2b & 2e), it is about the same size as P. aterrimus. Like bollei, the head is paler than the body, the colour varying between the subspecies (Table 2e).

This similarity to bollei seems convergent as they differ importantly in bill shape and colour, leg colour, size, and voice. It appears close to aterrimus with a very similar call (Chapin 1939), the same bill colour and shape and leg colour. It differs from aterrimus in lacking a white wing bar and white tail spots (cf. bollei and purpureus) and in having a longer tail.

P. castaneiceps is mainly allopatric with P. aterrimus, although there appears to be slight sympatry in north-eastern Zaire, and a single record from eastern Kenya suggests sympatry with P. c. schalowi, although there will be habitat segregation.

## DISCUSSION AND CONCLUSIONS

In view of the sympatry between P. purpureus and P. somaliensis they must be regarded as separate species; and so likewise must P. purpureus and P. damarensis. The hybridisation between P. niloticus and P. neglectus indicates that the species are very closely allied as do similarities in voice and plumage, and so they are grouped as a superspecies : somaliensis and damarensis can be regarded as arid-zone derivatives of purpureus. All three are highly gregarious although only purpureus has as yet been shown to breed co-operatively (Grimes 1974).

P. bollei has clearest affinities with purpureus and seems to be a forest derivative. It has diverged rather more in habitat, plumage and voice than the members of the purpureus superspecies and is placed in a species-group with this superspecies.

The partial sympatry and hybridisation of aterrimus and cyanomelas similarly indicates a close relationship between separate species, and these two likewise form a superspecies. P. minor, like somaliensis and damarensis, is an arid-zone derivative, but it is not clear whether it is derived from aterrimus or from cyanomelas. It is less closely related than aterrimus to cyanomelas and in view of the extensive sympatry with these species it is placed in a species-group with the aterrimus superspecies.

Table 2. Characters of wood-hoopoe taxa. (a) P. purpureus,  
P. somaliensis and P. damarensis

Subspecies	Wing ♂ (mm)	Tail ♂ (mm)	Bill ♂ (mm)	Plumage	Bill (ad.)
p. purpureus	125-146.5	146-187	41-62	glossy blue, violet, green	red
p. zuluensis	139-147	197-214	55-60	glossy blue, violet, green	red
p. marwitzii	140-161	210-235	54-61	glossy blue, violet, green	red
p. angolensis	141-165	215-265	57-64	glossy blue, violet, green	red
p. niloticus	131-157	201-228	47-54	duller, darker	red
p. guineensis	134-157	200-268	40-57	duller, darker	red
p. senegalensis	143-155	178-253	50-58	duller, greener	black except base
s. neglectus	139-150	172-216	47-54	dull. Upperside purple and green	black
s. somaliensis	148-160	195-232	48-62	dull. Purple	black, slender
d. damarensis	153-164	203-235	44-56	very dull, dark. Purple	red
d. granti	141-149	183-220	42-55	brighter, glossier, bluer	part black

Notes : (1) Females are slightly smaller (2) Legs and feet red in all species (3) White primary bar and white tail spots present in all species - clinal size increase from p. purpureus to p. marwitzii and p. angolensis (4) Voice apparently the same in all species (Benson 1948): prolonged harsh chatter and quiet chuckles

(b) P. bollei

Subspecies	Wing ♂ (mm)	Tail ♂ (mm)	Bill ♂ (mm)	Plumage
b. bollei	130-135	200-222	38-50	Head, throat buffish white; no white on wings and tail
b. okuensis	120-134	165	41	The same but white on forehead and throat only
b. jacksoni	131-142	179-215	35-46	The same but only head white

Notes : (1) Females are slightly smaller (2) Bill, legs and feet red in all subspecies (3) Voice as purpureus but quieter

Table 2 (continued). (c) P. aterrimus and P. cyanomelas

Subspecies	Wing ♂ (mm)	Tail ♂ (mm)	Bill ♂ (mm)	Bill ♀ (mm)	Plumage
a. aterrimus	97-108	110-121	28-35	26-30	glossy violet, steel blue; bill black; white wing bar; no white tail spots
a. emini	95-110	121-132	30-36	26-30	The same but nape and mantle less violet
a. notatus	97-107	118-136	29-39	26-27	as aterrimus but white spots on outer tail feathers only
a. anchietae	108-117	117-125	27-30		as aterrimus but white spots on all except central rectrices
a. anomalus	113-121	145-161	37-39	30-31.5	as aterrimus but bill small
P. cavei					as aterrimus but more blue
c. cyanomelas	108-117	121-140	45-53	36-42	violet, steel blue, green; bill black; white wing bar; no white tail spots
c. intermedius	108-117	155-170			as cyanomelas but some white tail spots
c. schalowi	109-127	154-201	43-49	32-42	as cyanomelas but white tail spots

Notes : (1) P. cavei is known only from a juvenile male (Macdonald 1946)  
 (2) a. anomalus from Traylor (1964) (3) Legs and feet black in all sub-  
 species (4) Voice : P. aterrimus - quiet chattering wha-wha-wha-wha-wha  
 and P. cyanomelas - high twittering, chattering and hooi-hooi-hooi.

(d) P. minor

Subspecies	Wing ♂ (mm)	Tail ♂ (mm)	Bill ♂ (mm)	Plumage
m. minor	92-98	95-107	29-35	White wing bar; no white tail spots; bill orange, decurved
m. cabanisi	98-112	108-125	31.5-36	As minor but no white wing bar

Notes : (1) Females are slightly smaller (2) Legs and feet black  
 (3) Voice a low musical trill

(e) P. castaneiceps

Subspecies	Wing O (mm)	Tail O (mm)	Bill O (mm)	Plumage
c. castaneiceps	101-107	165-170	30-32	Head chestnut both sexes
c. brunniceps	94-107	141-165	26-30	Head: ♂ glossy green or pale brown; ♀ brown; juvenile whitish. Both sexes
c. adolfifrederici	101-110	162-186	27-30	Head pale brown or whitish both /

Notes : (1) Females are slightly smaller (2) Bill, legs and feet black  
 in all subspecies (3) No white in wings or tail (4) Voice very similar  
 to P. aterrimus.

P. castaneiceps has characters of both purpureus and aterrimus. However, it does seem closer to aterrimus in respect of leg colour, size and voice and it forms a species-group with aterrimus, cyanomelas and minor. The possession of a dark glossy head by some adults suggests more recent divergence than bollei from purpureus. As castaneiceps occupies forest-edge habitats, limited introgression with aterrimus may have occurred.

Fig. 6 shows the suggested phylogeny of the Phoeniculidae. The ancestral Phoeniculus was probably a savanna form. The division into two groups is that of Phoeniculus, and Scoptelus and Rhinopomastus

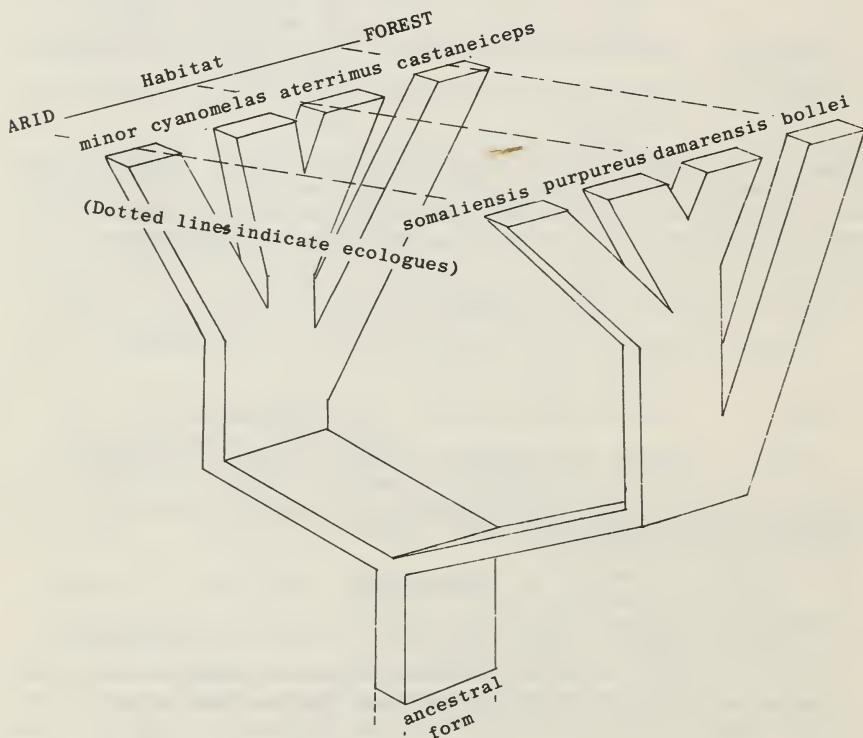


FIGURE 6. Diagrammatic Phylogeny for Phoeniculus

recognised by Chapin (1939) and Mackworth-Praed & Grant (1957, 1962, 1970). As each group now comprises a single species-group, divergence has not been great and it is valid to follow White (1965) in placing all species in Phoeniculus. The size differences may be a result of the ecological necessity for morphological difference between the two related species in the same habitat, as is suggested by Benson *et al.* (1971) for the differences in bill morphology between purpureus and cyanomelas. This seems valid for size and bill differences in all species of Phoeniculus : the small species feed more on fruit and around flowers than do the larger ones (Moltoni 1940). The sexual dimorphism in the bill shape of P. c. schalowi (Fig. 1b) is a further extension of this phenomenon (Benson *et al.* 1971).

The white wing bar and white tail spots in gregarious savanna species (purpureus superspecies and minor - Grimes 1974) has probably evolved through the selection pressures of flocking : a flight signal is important for these mobile birds. A reason for the lack of a wing bar in P. m. cabanisi has been suggested earlier. Both P. cyanomelas (Grimes 1974) and P. aterrimus (pers. obs.) join mixed feeding flocks and these generally have a white wing bar also. A continuous contrast signal (the light head) in the less mobile forest species is more important (Davidson 1975) : P. bollei is gregarious (Lohrl 1972) and P. castaneiceps joins mixed flocks (pers. obs.). Sociability usually develops from a non-gregarious state (Wynne-Edwards 1962) : the ancestral savanna Phoeniculus was probably not gregarious, and contrast plumage developed with increasing sociality. The absence of white on the wings and tail of forest species suggests that they diverged before sociality was well developed.

Subsequent to the divergence of the small and large groups, the radiation has followed essentially the same pattern in both groups, differences in present-day distribution probably resulting from varying divergence times. Relationships will only become clearer when more behavioural and ecological studies have been made. All Phoeniculus species would repay further investigation.

#### SUMMARY

The evolution and systematics of the Phoeniculidae are reviewed using geographical distribution, morphological, ecological and behavioural characters. Conclusions broadly agree with White (1965) in placing all species in the genus Phoeniculus. Eight species are recognised, having the phylogeny shown in Fig. 6; there are two species-groups of four species, each containing a superspecies, one being purpureus, somaliensis and damarensis and the other aterrimus and cyanomelas.

## ACKNOWLEDGEMENTS

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## THE AVIFAUNA OF WAZA NATIONAL PARK, CAMEROUN, IN DECEMBER

by Antony Pettet

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Lists of birds seen in Waza National Park and a certain amount of comment on their ecology and movements have been provided by Fry (1970), Broadbent (1971), Mundy (1972) and Holmes (1972, 1974). I visited the Park from 24 to 28 December 1971 and saw several species not recorded by these observers\*. While comparing the various lists it became clear to me that potentially useful information on seasonal and year-to-year changes in some of the less spectacular Palaearctic wintering visitors and African migrants is in danger of being lost by undue attention to avifaunal listing. Although the area is large and the stay of most visitors short, the Park has well-defined limits, is ecologically simple, and it should be relatively easy to provide some assessment of the more conspicuous changes by comparison with well-annotated lists. I have, therefore, listed all species seen by me. Where my counts or estimates do not differ materially from the status or counts given by Fry (*op. cit.*) who has provided the most comprehensive account, or by Mundy (*op. cit.*) who appears to have visited the Park more or less when I did, I have listed the names only. Otherwise I have given my own observations in detail, sometimes commenting on the differences where these are of interest, and occasionally giving ecological details.

## ECOLOGICAL COMMENTS

Fry has briefly sketched the main ecological features of the Park but, between the time of his visit in late November and mine in late December, a number of minor changes take place with some possible consequences to birds.

In December the Acacia seyal on cotton soils is normally leafless, though when I visited the Park a few small patches of the trees were already beginning to produce leaf- and flower-buds. This makes it easier to see birds but meant that much of the seyal woodland was practically shadeless. By contrast, the Anogeissus-Mitragyna-Balanites woodland of the overlying sands was still in leaf and there was also considerable shade in the Balanites-Tamarindus-Mitragyna thickets around the water-holes. Like the seyal woodland, the Commiphora bush on the deep sands was also leafless and practically shadeless.

\* Nettapus auritus, Polyboroides radiatus, Calidris minuta, Sterna leucoptera, Phylloscopus collybita.

There were no grass fires during my visit and, to judge from Fry's comments and the state of the ground at my visit, it would seem that much of the annual grass-burning is done in November and more-or-less completed by mid-December. One area I went over, however, had the appearance of very recent firing. Regular grass-firing is presumably the policy of the Park authorities, but it seems to be gradually destroying the seyal woodland in some parts of the Park. The absence of burning grass may explain the comparative infrequency of certain species at my visit compared with Fry's, although this may not have been the only reason.

The annual Sesbania which forms a conspicuous edge to the "rice-swamp" outside the Park had died down by the time of my visit. Fry found this very productive in warblers and other small birds so its virtual disappearance by December probably explains the low numbers I recorded. Fry's visit also seems to have co-incided with the tailend of the main southward passage. For example, in late November he found birds of prey present in abundance and variety, in contrast with the situation in late December when they were all very much less frequent. In particular, Circaetus spp., Buteo spp. and Aquila rapax were all far less frequent and Falco biarmicus was not recorded. Bustards, frequent in Fry's visit, were not recorded in December, and the same was true of the 'resident' Hirundo aethiopica and Nilaus afer; I assume there is some movement of these birds out of the area although the latter may have been overlooked because of its unobtrusive nature.

The other accounts, unfortunately less detailed than Fry's, suggest that the northward passage starts in late February and continues beyond late March, the time of Broadbent's visit. The extent of passage in the Park towards the end of the dry season is, however, confused by the concentrating effects of the limited surface water compared with the beginning of the dry season. It is to be hoped that future visitors will provide more comprehensive accounts of the birds found at that time of year.

#### SPECIES RECORDED IN DECEMBER 1971

During my stay I made three morning visits to the western side of the Park, concentrating on different sections of the woodland as well as on the waterholes. Like others before me I visited the large "rice-swamp" on the north-west side of the Park in the vicinity of the Camp, spending the afternoon in its neighbourhood and on the large inselberg close by. Birds recorded at these two places outside the Park have been listed as such. I also spent one morning on the southbound road, driving about 20 km beyond the reserve to visit the roadside waterholes and vegetation, including some of the marginal vegetation of the "rice-swamp". Birds seen during this journey, to the periphery of the reserve and adjacent to it, have been included in the list and are referred to as being seen on the 'southbound road'.

Struthio camelus

Ardea cinerea 1-2 birds at some waterholes in the reserve and c.18 on the north end of the rice-swamp; single bird on southbound road.  
A. melanocephala not recorded on the rice-swamp and seemingly restricted to waterholes in the reserve where there were usually 3-4 per waterhole. Fry's report of hundreds on the rice-swamp would suggest passage through the area in November (cf. Elgood, Fry & Dowsett 1973).

Egretta alba c.30 on the rice-swamp

E. garzetta

Ardeola ibis an estimated 400-500 on rice-swamp; not as conspicuous in the reserve where it was noticeably associated with elephants, e.g. a herd of 20 elephants was accompanied by c.60 birds.

A. ralloides

Scopus umbretta decidedly infrequent; a total of three for all waterholes visited; four at one waterhole on the southbound road outside the reserve.

Ciconia episcopus twos and threes at the bigger waterholes and one with c.20; not recorded from the rice-swamp. C. ciconia was not recorded - the birds seen by Fry were probably attracted by the grass fires and were not wintering.

Anastomus lamelligerus two on rice-swamp; not recorded on reserve although Mundy saw four at one waterhole.

Ephippiorhynchus senegalensis a total of three at reserve waterholes and one on rice-swamp.

Leptoptilus crumeniferus two near Camp; none on the reserve or rice-swamp. Frequent and attracted to fires in late November, so presumably there is some movement out of the area.

Threskiornis aethiopicus

Plegadis falcinellus one on rice-swamp; not apparently recorded before.

Bostrychia hagedash

Anas querquedula at least 2,000 on rice-swamp, but since they were only seen when disturbed I think there were many times this number present.

Dendrocygna viduata c.160 at one waterhole in the Reserve.

Nettapus auritus two adults with a full-grown immature bird on edge of rice-swamp; not previously reported.

Sarkidiornis melanotusPlectropterus gambensisGyps ruppelliiPseudogyps africanus

Trigonoceps occipitalis one near waterhole.

Necrosyrtes monachus Fry reported it as scarce but c.12 were visiting the Camp rubbish dump.

Circus pygargus one.

C. aeruginosus an adult male and an immature hunting over the rice-swamp, repeatedly flushing up Garganey, Ruff and occasionally geese, but the cranes appeared to ignore them.

Polyboroides radiatus one at a well-vegetated waterhole; not reported previously.

Terathopius ecaudatus

Circaetus gallicus

Accipiter badius a single bird.

Melierax metabates

M. gabar two typical and one melanistic phase birds.

Buteastur rufipennis a total of about ten scattered in the western side of the reserve, and six on the southbound road; from experience of this species elsewhere I suspect that this is rather late for these numbers so far north.

Milvus migrans infrequent; c.20 in shade at one waterhole during the middle of the day probably represented most or all of the population of the reserve; c.12 on the southbound road and two on the rubbish dump at the Camp were the only other records. Fry found it 'abundant' in November, which suggests that the bird was still moving through the area then and may well have been attracted by grass fires.

Haliaeetus vocifer

Elanus caeruleus

Falco tinunculus 10+ scattered over the more open areas of the reserve; one on the southbound road and one at the top of the inselberg. Probably no real difference between November and December.

Lophoaeetus occipitalis not more than two in the reserve. Fry found it 'frequent'.

Francolinus clappertoni frequent in denser vegetation around waterholes but usually seen only in late afternoon when birds left cover.

Numida meleagris

Balearica pavonina an estimated 7,000 in small parties on the northern side of the rice-swamp, and presumably more in the centre; seen at the waterholes on the reserve only in ones and twos; Holmes reported c.10,000 at the swamp in late February.

Actophilornis africanus seen only on the rice-swamp - 3+ adults and an adult with two half-grown young 6-8 weeks old. Although this species is mainly a wet-season breeder, it has a long breeding season if conditions are favourable. I have found a nest with eggs in January near Ibadan.

Vanellus tectus a single bird on a bare area in the reserve.

V. senegallus single bird at a waterhole.

V. spinosus c.30 on dried mud above the rice-swamp.

Charadrius dubius six on sandy upland near the marsh.

Tringa nebularia one on southbound road.

T. stagnatilis 2+ on the rice-swamp. Also recorded by Broadbent.

T. glareola one on the reserve; 6+, marginal pools of rice-swamp.

T. ochropus

T. erythropus 6+ with Ruff on the rice-swamp; not seen on the reserve and possibly less frequent than in November.

Gallinago gallinago five flushed from marginal pools of the rice-swamp and presumably common in its centre.

Philomachus pugnax c.2,000 seen on the rice-swamp but many more were clearly present; several parties at pools on southbound road.

Himantopus himantopus a total of five at waterholes.

Glareola pratincola c.300 feeding over the marsh in late afternoon, suddenly appearing about 1630 hrs and remaining in the air until 1745 hrs; recorded by Broadbent.

Sterna leucoptera one over pool on southbound road within southern limits of reserve; not recorded previously.

Streptopelia turtur Only one flock seen in the reserve - c.100 in Balanites-Acacia polycantha vegetation near one waterhole in southwest corner of reserve; outside the reserve a few birds in marginal Balanites-Acacia seyal vegetation bordering the marsh along southbound road but nowhere common. Mundy did not see the bird, neither did Button in late January (ex Holmes). However when Holmes visited the reserve in late February it was very numerous, possibly more so than in Fry's visit in late November 1969 when in excess of 60,000 birds were estimated within the reserve. Broadbent also recorded large numbers in late March 1969. This rather suggests a passage through the Park in October-November and February-March with low numbers in between. Mid-winter movements are a conspicuous feature of birds wintering in the Sudan and are probably to be expected in West Africa. My own counts at Zaria near the southern limit of the wintering zone are consistent with this and showed, amongst other things, that penetration into the south was particularly marked in the winter of 1971-72, following a poor wet season. What was true of Nigeria that winter is likely to have been true of the Cameroun Republic. In years when the previous rains have been better the Turtle-Dove may remain in the reserve throughout the dry season in larger numbers. The relative infrequency of the bird in December and January may be related to shade and food. Balanites, Mitragyna and Anogeissus, though not leafless, were shedding leaves, and shade about the waterholes a declining asset. By February and March the pre-rains leaf-flushing would be well under way. Grain may be in short supply following widespread grass-burning and the dry-season grain Sorghum to the north of the reserve, though heading, was nowhere near ripe.

S. decipiens frequent around the better-shaded waterholes and in the denser vegetation of the rice-swamp.

S. vinacea mostly in Anogeissus woodland but also at waterholes.

S. roseogrisea

S. senegalensis recorded as 'frequent' by Fry but only two birds seen by me - one in denser vegetation near waterhole in reserve and one in scrub at base of inselberg.

Oena capensis

Turtur abyssinicus locally frequent in Balanites and low scrub around waterholes and more noticeable in late afternoon; otherwise scarce.

Coracias abyssinicus

Upupa epops

Phoeniculus purpureus a flock of eight near the rice-swamp is my only record. Recorded as 'frequent' in late November, suggesting perhaps some movement away from the reserve after breeding (cf. Salvan 1967-9).

P. aterrimus, recorded in small numbers by Fry, was not seen during my visit and may also be a part-migrant (Elgood, Fry & Dowsett 1973).

Ceryle rudis one, rice-swamp.

Alcedo cristata

Halcyon leucocephalus two in Balanites in swamp edge and two on south-bound road; recorded as common in November so presumably the wet-season visitors are late to leave this area and a few remain throughout the dry season (cf. Elgood, Fry & Dowsett 1973).

Merops orientalis

M. nubicus scarce in the reserve (only four recorded) but moderately common about the rice-swamp (c.60) and at roadside pools on the southbound road (c.30 per km).

Tockus nasutus possibly less frequent than in November ('frequent'); one group of four in the reserve; c.30 on the southbound road moving westwards in small groups - but the date seems too late for migration of this species.

T. erythrorhynchus common in widely dispersed small groups in reserve and on southbound road; more frequent in A. seyal woodland.

Bucorvus abyssinicus

Eremopteryx leucotis common in the reserve, particularly noticeable where roads run over cotton soil.

Motacilla alba two only, on rice-swamp; presumably near the southern limit of its wintering range.

M. flava in small numbers at waterholes on the reserve and about the rice-swamp; certainly not 'common' as in November, so the bulk of birds present then move southwards. One flava and two feldegg males noted.

Oenanthe oenanthe

O. bottae a few birds on the newly burnt area mentioned earlier.

Sylvia communis one in vegetation at base of inselberg and another in a sandpit on the southbound road.

S. curruca six at base of inselberg, mostly in Acacia albida.

S. cantillans one in subsong in vegetation at base of inselberg.

Acrocephalus schoenobaenus 3+ in vegetation at edge of rice-swamp.

Phylloscopus collybita one in vegetation at base of inselberg; not previously recorded.

Camaroptera brachyura

Riparia riparia thinly spread over the whole area and also present well south of the reserve; collectively numbers considerable, an estimated 8-10,000 for the whole reserve.

Dicrurus adsimilis

Lanius excubitorius

L. collurio two on the reserve, both L. c. isabellinus.

Corvus albus maximum of two at the Camp.

Lamprotornis chalybaeus a flock of c.30 in Balanites at rice-swamp edge.

L. caudatus 'frequent' rather than 'common' in the reserve.  
Buphagus africanus the only record was of four on a giraffe.  
Anthreptes platura single pair visiting Loranthus at Camp, probably nesting.  
Passer griseus 6+ at one waterhole in the reserve and small flocks with Quelea in vegetation on southbound road, so far more common than Fry's records suggest.  
Petronia dentata breeding; single males noticed around inselberg; but some in mixed finch flocks and 10+ seen with Passer at one waterhole.  
Ploceus spp. nonbreeding birds present in 'finch'-flocks.  
Quelea quelea not conspicuous in reserve and only one small flock of c.20 seen at one waterhole, but many thousands in marginal vegetation of rice-swamp on southbound road, usually in small flocks of 100-200. Numbers difficult to estimate but 1-2 million may have been present. One old nesting colony in a patch of Acacia polyacantha in the reserve held an estimated 0.8-1.0 million nests.  
(Bubalornis albirostris old nesting sites occur in the reserve but no birds were seen.)  
Serinus leucopygius several pairs with territories about the Camp.  
Amadina fasciata only one pair recorded on the southbound road but the species is presumably breeding and inconspicuous, unless population depleted by birds moving southwards to breed.  
Estrilda bengala  
Lagonosticta senegala  
Lonchura malabarica  
Vidua (Hypochera) sp.  
V. orientalis a male in the reserve.

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## OBSERVATIONS ON THE SOCIAL BEHAVIOUR OF HELMET-SHRIKES

by P. W. Greig-Smith

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The helmet-shrikes Prionops plumata and Prionops caniceps are the only members of their subfamily (Laniidae: Prionopinae) that occur in West Africa. They have distinctive habits characterised by intense sociability, and a co-operative breeding system in which several birds assist in nest-building, brooding and care of the young. P. plumata is a savanna woodland species, while P. caniceps is restricted to forest. This paper describes some differences in social behaviour between them, and considers how their social behaviour is affected by co-operative breeding and general ecology.

P. plumata was studied in the Guinea savanna zone at Mole National Park, Northern Region, Ghana, from 4 July to 3 September and from 30 October to 3 December 1975. P. caniceps was observed in mature secondary forest at Ife, Western State, Nigeria, between 28 September and 3 October 1975.

## OBSERVATIONS

Prionops plumata

Birds were encountered regularly throughout and the species is probably resident at Mole all year. There is no evidence for its migration in Nigeria (Elgood, Fry & Dowsett 1973), although in southern Africa it is apparently prone to local movements (Vernon 1966). Breeding dates at Mole are not known, but records elsewhere (Mackworth-Praed & Grant 1973) suggest that birds might be expected to nest in the late dry season (March to April). No breeding activity was seen during the present study.

Social groups

On all but one occasion the birds were seen in groups, ranging in size from 3 to 13. In early July three flocks, of 8, 9 and 10 birds, were present in one area of savanna, and the groups appeared to be constant and coherent. During August they became less coherent and broke up into smaller units (Fig. 1). The small sample from November indicates that larger groups had reformed.

Fig. 2 shows the composition of a sample of 18 birds (in two groups) that were mist-netted in mid-July. The population appears to

contain four categories: (a) large adult birds, (b) smaller adults, (c) small juveniles, and (d) juveniles and sub-adults intermediate in size between (a) and (b). It is probable that (a) and (b) represent males and females respectively, in various age-classes. (c) and (d) may be either female and male offspring of the current year's breeding season, or (d) might be one-year-old birds which have not achieved full adult plumage. Bannerman (1933-1951) recorded sexual dimorphism in size for P. plumata.

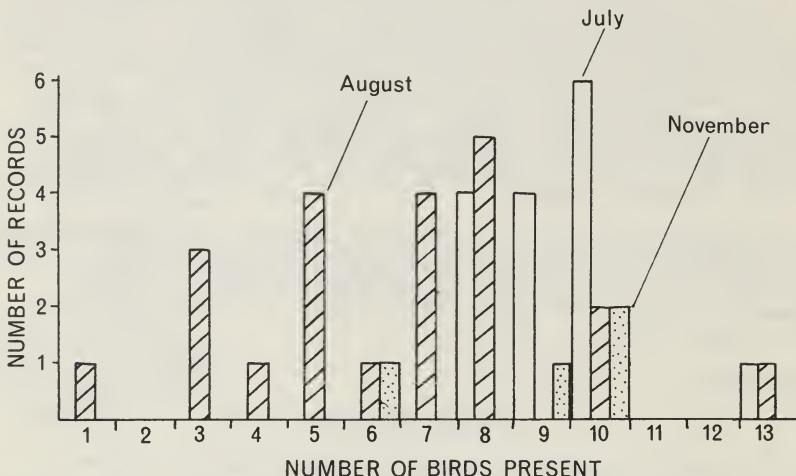


Figure 1. Size of Prionops plumata groups observed at Mole National Park, Ghana, in July, August and November 1975.

#### Territory

Flocks were highly mobile, ranging over a large area of savanna. Although 18 birds were colour-ringed, it was not possible to plot the ranges of individual groups. It is certain, however, that considerable overlap of ranges occurred, as recorded by Vernon (1966). A meeting between groups was seen only once and involved behaviour never seen in other contexts. A group of ten and one of eight were perched in adjacent trees, in silence, and single birds made continual swooping and diving attacks on members of the other group. Group members were huddled together on a single branch, remaining much closer than was seen on other occasions. The incident ended when the larger group suddenly flew off in a tight flock, followed immediately by the departure of the other group. This interaction suggests that territories are defended on occasion, but much overlap is tolerated.

### Behaviour within groups

On most occasions the birds were foraging, typically within the low and middle parts of the trees, although they descended to feed on the ground where the grass had been cleared. The only food items clearly seen were large caterpillars, extracted from crevices in bark, particularly of the shea butter tree Butyrospermum paradoxum, in which a high proportion of foraging time was spent. Adult birds frequently presented food to juveniles, usually preceded by wing-shivering by the young bird. Birds in full adult plumage were seen trying to grab food being offered to juveniles. The frequency of feeding juveniles appeared to decline through the study, and none was recorded during November.

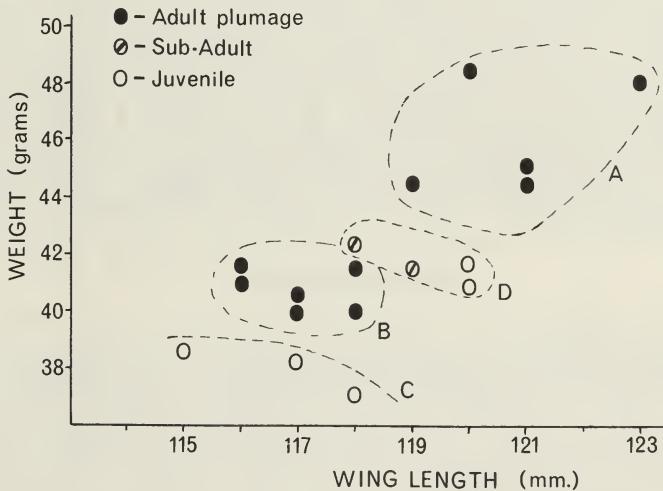


Figure 2. Composition of Prionops plumata population at Mole National Park, Ghana, in July 1975 (sample of 18 birds).

The species has a distinctive call, a chatter made by the whole flock. This seems to be uttered immediately after a flock movement has been initiated by one of the birds, and doubtless maintains cohesion of the flock. Bill-snapping was seen in situations where it might constitute alarm and/or threat (e.g. during the territorial dispute described above, and on the approach of humans). During November the groups were less vocal than in July and August, and calling was confined to single birds in the group.

P. plumata is one of very few savanna species which remained active during the middle of the day at Mole - flocks were equally mobile and vocal at all times of day. It has been suggested by Harwin (1959) that groups follow the same route each day, and the Mole birds seemed to confirm that, as they regularly appeared at a particular spot at the same time of day. The route is not invariable, however, and may change substantially after several days.

#### Interactions with other bird species

Vernon (1966) notes cases from Rhodesia in which P. plumata groups mobbed predators, and formed part of mixed-species insectivorous flocks. They apparently join mixed flocks in Malawi (P.G.H.Evans pers. comm.) and in some areas of West Africa (Mackworth-Praed & Grant 1973), but at Mole they were notable for almost total absence of association with other birds. They were one of the few insectivorous savanna species which did not join mixed flocks (Greig-Smith in prep.), and only once were seen in the vicinity of another species (the wood-hoopoe Phoeniculus purpureus) without aggression. On one occasion a group was attacked by a roller Coracias abyssinica, and once a group was attended by a drongo Dicrurus adsimilis, which appeared to benefit by feeding on the insects flushed by the moving flock of helmet-shrikes. They gave the impression of trying to evade the drongo, and ceased feeding when it joined them.

#### Prionops caniceps

A group of seven P. caniceps was observed on two occasions at Ife, and showed several differences from P. plumata. The group kept within the tree canopy, at heights of 10 to 20 metres, forming a looser flock than P. plumata. They moved much less rapidly through the area and made less frequent vocalisations. These consisted of bill-snaps, whistles, and a loud explosive chack-ack. Calls did not appear to be correlated with movement of the group in the way that they are in P. plumata. Foraging behaviour was quite different - the diet appeared to consist of winged insects, captured during fluttering forays away from a perch, not searched for on bark and foliage. The observed capture rate was much higher than ever seen in P. plumata. Several other bird species in the vicinity of the group were ignored.

#### DISCUSSION

It is clear that all of the activities of the helmet-shrikes are carried out in highly integrated social groups. Explanations for flocking fall into three categories - an anti-predator device, an aid to foraging, or the satisfaction of a general gregarious tendency (see discussion in Morse 1970). Although both of the first two effects may be operating, the requirements of co-operative breeding and the disinclination of P. plumata to join mixed flocks suggest that their sociality is connected primarily with the breeding system.

Both species show adaptations for promoting the cohesion of flocks, particularly necessary for highly mobile species such as P. plumata. The plumage is conspicuous, incorporating patches of white on dark colours, displayed in flight; and the vocalisations are loud, frequent and distinctive. It is likely that the constant movement of P. plumata improves cohesion, since following reactions are known to be of major importance in flocking (Moynihan 1960).

The high level of social interaction which must occur in groups was not investigated, but is likely to involve communication via the erectile crests and brightly-coloured eye wattles of the adults, which distinguish them from the dusky juveniles.

The differences in behaviour between the two species can be attributed to the habitats they occupy, and differences in feeding ecology. The louder calls and less conspicuous plumage of P. caniceps reflect low visibility in forest, while the looser flocking habit is appropriate to the species' lower mobility. The higher rate of prey capture by P. caniceps suggests that they may be able to satisfy their foraging requirements within a smaller area than P. plumata. Therefore they would not need to adopt the wandering habits of the latter, nor develop such extreme adaptations for cohesive flocking. The mobility of P. plumata may be due to causes other than a low density of available prey. There is a general pattern among birds at Mole to be wide-ranging in savanna, and sedentary in forest (Greig-Smith, in prep.). This probably constitutes an adaptation to the annually-burnt savanna environment, which becomes locally untenable during the dry season.

In many co-operative breeding systems, offspring remain with their natal group to assist with raising the young of the following year (Fry 1972, Grimes 1976), but at some point at least one sex must disperse to join other groups. The break-up of P. plumata groups in August probably indicates such a dispersal of immatures, followed by their acceptance into neighbouring groups by November. The extensive overlap of ranges of groups probably helps this exchange. There was no evidence to support the alternative explanation for the break-up of groups proposed by Vernon (1966), that there is a disbanding of composite flocks formed for migration. The observations made do not provide information on which sections of the population (Fig. 2) are involved in dispersal. Theoretically either or both sexes might move, during their first or subsequent years. It does appear, however, that dispersal closely coincides with or follows the end of juvenile-feeding by the adults, marking the attainment of foraging independence.

The reasons for avoidance of other bird species are obscure, although the absence of P. plumata from mixed flocks is unsurprising, since the helmet-shrikes may be expected to accrue whatever advantages are to be gained by flocking from their own single-species flocks.

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## MONTANE BIRDS OF NIGERIA

by J.H. Elgood

Received 18 March 1976

The addition of over 40 new bird species to the Nigerian list in just over ten years, reported by Elgood (1975), prompts the question as to how many additional species may be expected. Almost all recent additions fall into one of four categories :-

- (1) Marine species, waders, skuas and gulls, whose addition can be attributed to more skilled observation at coastal stations such as Lagos;
- (2) Palaearctic migrants, mainly passerines whose presence within Nigeria has been revealed by a more intensive use of mist-nets, particularly in the north;
- (3) Ethiopian species formerly known east and west of Nigeria, for which a Nigerian record has shown that an apparently discontinuous distribution is erroneous;
- (4) Montane Ethiopian species, recently shown to range west into Nigeria to such upland areas as the Obudu and Mambila Plateaux.

Although the last group is the smallest, it would seem to be rather easier to forecast further likely additions to this category than to the others. This article therefore surveys the known montane birds of western Africa to enquire what new birds should be looked for by ornithologists who have the opportunity to visit the high plateaux of Nigeria's eastern border. Likely additional passerines have been sought by scrutiny of the distribution maps of Hall & Moreau (1970) while non-passserines have been sought in White (1965) although only a few groups, of rather smaller birds, have species restricted to montane habitats.

The ecological reasons for the restriction of so many species to upland habitats are obscure but most authorities agree (e.g. Moreau 1966) that altitudes above about 1400 m support species peculiar to such areas which consequently tend to have geographically isolated populations, some of which have been separated long enough to show taxonomic differentiation as distinct subspecies in the different montane areas.

Within Nigeria most of the Jos Plateau does not exceed 1400 m and in any case the area is greatly disturbed by human activities. It is therefore not surprising that only two birds call for comment from this area, both being essentially restricted to it. These are the Adamawa Turtle-Dove Streptopelia lugens hypopyrrha ranging east into Cameroun and having other races in mountainous areas in east Africa and the Yemen;

and the Jos Long-billed Pipit Anthus similis josensis, a race of a widespread and highly differentiated species with josensis known only from the Jos Plateau (R.E. Sharland) and the race bannermani occurring on the Obudu Plateau and extending widely through African highlands (Table 2). The Jos Plateau has been fairly well explored ornithologically and therefore is relatively unlikely to produce species new to Nigeria.

By contrast, montane areas of the eastern borders of Nigeria, such as the Obudu and Mambila Plateaux, are much more likely to produce new records. Table 1 lists species that should be looked for in these eastern highlands, with my own estimation of their likelihood of occurrence.

Table 1. Prospective new Nigerian montane birds

	Adjacent occurrences	Likelihood in Nigeria
<i>Francolinus camerunensis</i>	Confined to Mt Cameroun	Unlikely
<i>Aplopelia larvata</i>	Cameroun, Fernando Po	Very likely
<i>Tauraco bannermani</i>	Bamenda area	Quite likely
<i>Malacopterus kupeensis</i>	Kupe Mt only	Unlikely
<i>Turdus</i> sp.*		
<i>Alcippe abyssinica</i>	Cameroun, Fernando Po	Very likely
<i>Bradypterus barratti</i>	Cameroun, Fernando Po	Very likely
<i>Cisticola robusta</i>	Bamenda area	Quite likely
<i>Apalis sharpei</i>	Cameroun, Zaire, Sierra Leone	Very likely
<i>Apalis pulchra</i>	Cameroun	Quite likely
<i>Muscicapa adusta</i>	Cameroun, Fernando Po	Very likely
<i>Platysteira peltata</i>	Cameroun	Quite likely
<i>Nectarinia ursulae</i>	Cameroun, Fernando Po	Very likely

\* The taxonomy of West African thrushes is in considerable confusion, with White, Bannerman and Mackworth-Praed & Grant all assigning the Kurrichane Thrush to different species : *T. pelios*, *T. libonyanus* and *T. olivaceus* respectively. In addition there is a montane thrush, *T. abyssinicus* in White's nomenclature with a race nigrilorum on Mt Cameroun and another poensis on Fernando Po. Thus if a race of this should be found at Obudu or elsewhere in Nigeria it would constitute an additional species in White's classification.

The view is taken that species long enough established in western Africa to have reached Fernando Po, even if below 1400 m there, are very likely also to occur in Nigeria. Those species found in Cameroun highlands alone are regarded as unlikely within Nigeria if their known range is very limited (unless very adjacent to Nigeria), but more likely to be found to occur in Nigeria if fairly widespread in Cameroun highlands.

To bring the 12 species in Table 1 more into perspective Table 2 has been prepared to show the total complement of West African species that can be regarded as montane together with their known occurrences at a range of West African loci and, where applicable, in East Africa also. Some of these species are not confined to montane habitats in other areas but nevertheless seem to be restricted to montane habitats at least in Cameroun and Nigeria. This point is well illustrated by the Stonechat *Saxicola torquata*, a lowland bird in Europe but strictly montane in West Africa. Several other species occur in lowlands in other parts of Africa. Sight records are shown in parenthesis, and here a further 11 species (denoted by an asterisk) lack full confirmation for Nigeria. It is hoped that before the Check-List is finalised observers visiting the eastern high plateaux of Nigeria will be able to furnish skin, mist-net or well authenticated photographic records of some of these birds.

In conclusion, it would seem that no more than ten or 12 additional montane species are likely to be added to the Nigerian list, but an equal number require proper confirmation so that the eastern plateaux are clearly well worth continued ornithological investigation.

Table 2. Montane birds of West Africa

	A Mt Cameroon	B Cam. highlands	C Fernando Po	D Obudu plateau	E Mambila plateau	F Jos plateau	G elsewhere W.Afr.	H E.Afr.Highlands
( <i>Francolinus camerunensis</i> )	+							
* <i>Columba arquatrix</i>		+	+	(+)			+	
<i>Streptopelia lugens</i>		+				+		
( <i>Aplopelia larvata</i> )	+	+	+					
( <i>Tauraco bannermani</i> )		+						
<i>Apus aequatorialis</i>		+				?	+	
<i>Apus barbatus</i>			+	+				+
<i>Apaloderma vittatum</i>		+	+	+				
<i>Merops variegatus</i>		+		(+)	+			
<i>Pogoniulus coryphaeus</i>	+	+		+			+	
<i>Jynx ruficollis</i>					+		+	
<i>Campethera tullbergi</i>	+	+	+	+				+
<i>Mesopicus elliotii</i>	+	+	+	+				
* <i>Psalidoprocne fuliginosa</i>	+	(+)	+	(+)				
<i>Anthus novaeseelandiae</i>	+	+		+	?	+	+	
<i>Anthus similis</i>	+	-		+	+	+	+	
* <i>Motacilla clara</i>	+	-		(+)		+	+	

	A	B	C	D	E	F	G	H
<i>Campethera caesia</i>	+	+	+	+				+
<i>Andropadus montanus</i>	+	+	+	+				+
<i>Andropadus tephrolaemus</i>	+	+	+	+			+	+
<i>Phyllastrephus flavostriatus</i>	+	+						down to 700 m
<i>Phyllastrephus poensis</i>	+	+	+	+				+
<i>Laniarius atroflavus</i>	+	+						
<i>Laniarius poensis</i>	+	+	+	+				+
<i>Malacorhynchus gladiator</i>	+	+						
( <i>Malacorhynchus kupeensis</i> )								
* <i>Onychognathus walleri</i>	+	+	+	(+)				
<i>Saxicola torquata</i>	+	+	+	+			+	+
<i>Cossypha bocagei</i>	+	+	+	+				{ lowlands out-side Africa
<i>Cossypha isabellae</i>	+	+						
<i>Cossypha roberti</i>	+	+	+	+				
( <i>Turdus abyssinicus</i> )	+		+	?				
( <i>Alcippe abyssinica</i> )	+	+	+					
<i>Trichastoma poliothorax</i>	+	+	+	+				
<i>Lioptilus gilberti</i>	+	+						
<i>Bradypterus cinnamomeus</i>	+	+						+
( <i>Bradypterus barratti</i> )	+	+	+					+
<i>Schoenicola platyura</i>	?	+					+	also lowlands
<i>Phylloscopus herberti</i>	+	+	+	+				
( <i>Cisticola robusta</i> )								also lowlands
* <i>Cisticola hunteri</i>	+	+		(+)				+
<i>Prinia epichlora</i>	+	+	+	+				
( <i>Apalis pulchra</i> )								+
( <i>Apalis sharpii</i> )							+	also lowlands
<i>Apalis cinerea</i>	+	+	+	+				+
<i>Camaroptera lopezi</i>	+	+	+	+				
( <i>Muscicapa adusta</i> )	+	+	+					+
( <i>Platysteira peltata</i> )	+	+						also lowlands
<i>Trochocercus albiventris</i>	+	+	+	+				+
( <i>Nectarinia ursulae</i> )	+	+	+					
<i>Nectarinia bouvieri</i>	+	+	+	+	+			also lowlands
<i>Nectarinia preussi</i>	+	+	+	+	+			+
<i>Nectarinia oritis</i>	+	+	+	+				
<i>Linurgus olivaceus</i>	+	+	+	(+)				+
<i>Ploceus baglafecht</i>						+		
<i>Ploceus insignis</i>	+	+	+	+				
* <i>Ploceus bannermani</i>				(+)				
<i>Ploceus bicolor</i>	+	+	+	+				+
* <i>Euplectes capensis</i>	+	+		(+)				+
* <i>Nesocharis shelleyi</i>	+	+	+	(+)				
<i>Clytospiza monteiri</i>						+		+
<i>Clytospiza dybowskii</i>					(+)	+	+	+
<i>Cryptospiza reichenowi</i>	+	+	+	+				
<i>Estrilda nunnula</i>	+	+	+	+				
Total : 64 species	46	58	36	44	8	3	10	32
Percent :	72	91	56	69	12.5	5	16	50

## BIRDS OF BULATURA OASES, BORNO STATE

by P. Hall

Received 15 May 1976

The Bulatura Oases lie 65 km to the north of Gashua in Borno State, Nigeria. They extend over a wide area of typical Sahelian savanna with scattered Acacia raddiana and Commiphora africana, but there has been extensive destruction of the vegetation and the sand-dune systems are unstable. In these arid surroundings the oases are exceptionally rich ecologically, with at least three retaining water throughout the dry season. All of the oases have deep potash deposits and this forms an important export from the area to the south. A belt of Dum Palms Hyphaene encircles all of the oases, and around the shores cassava, okra, sweet potatoes and onions are grown. The birdlife of the area is particularly rich and amongst the many interesting species recorded, Cape Wigeon Anas capensis, Hottentot Teal A. hottentota, Three-banded Plover Charadrius tricollaris and Avocet Recurvirostra avosetta are particularly interesting. Only four visits have been possible : in March and September of 1973, December 1975 and February 1976. The full list of species recorded follows below, scientific nomenclature following White (1960-65) and English names following Mackworth-Praed & Grant (1970-73).

Podiceps ruficollis Little Grebe 4 in Sep., 8 in Dec., 8 in Feb.  
Ardeola ibis Cattle Egret Small numbers on all visits, with a maximum of 35 in Sep.  
Egretta alba Great White Egret Only recorded in Feb., when 6 present.  
Ardea melanocephala Black-headed Heron Small numbers in Sep., Dec., and Feb. with a maximum of 20 in Dec.  
Ciconia abdimii Abdim's Stork Small numbers in Sep. only.  
Threskiornis aethiopica Sacred Ibis 30 in Dec., 7 in Feb.  
Plegadis falcinellus Glossy Ibis A few in Sep. and Dec., up to 4 in Mar.  
Alopochen aegyptiaca Egyptian Goose 4 in Dec., 6 in Feb.  
Anas capensis Cape Wigeon 20 in Sep., 50 in Dec., 10 in Feb.  
Anas acuta Pintail Only recorded in Dec., with 18 present.  
Anas hottentota Hottentot Teal A few in Sep., Feb. and Mar., with a maximum of 8 in Feb.  
Anas querquedula Garganey 3 in Sep., 1 in Mar.  
Anas clypeata Shoveler Only present in Dec., when 40 recorded.  
Gyps bengalensis White-backed Vulture 1 in Sep., the only record.  
Neophron monachus Hooded Vulture A few in Sep., Feb., and Mar.  
Melierax metabates Dark Chanting Goshawk A few in Sep. and Mar.  
Milvus migrans Kite A few in Sep. and Mar. only.  
Limnocorax flavirostra Black Crake 1 recorded in Dec.

Gallinula chloropus Moorhen Small numbers in Dec., Feb. and Mar. with a maximum of 15 in Feb.

Porphyrio porphyrio Purple Gallinule A pair with 2 young seen in Feb.

Balearica pavonina Crowned Crane 1 in Sep. and 2 in Dec.

Vanellus spinosus Spur-winged Plover Recorded on all visits with a maximum of 100 in Dec.

Charadrius hiaticula Ringed Plover 1 in Feb.

Charadrius dubius Little Ringed Plover 2 in Sep., 2 in Feb.

Charadrius pecuarius Kittlitz's Sand Plover 20 in Dec., 4 in Feb.

Charadrius tricollaris Three-banded Plover Present on all visits with 2 in Sep., 8 in Dec., 6 in Feb. and 1 in Mar.

Charadrius alexandrinus Kentish Plover 2 in Dec.

Numenius arquata Curlew 1 in Dec., 1 in Feb.

Limosa limosa Black-tailed Godwit 2 in Dec.

Tringa stagnatilis Marsh Sandpiper 1 in Dec., 1 in Feb.

Tringa glareola Wood Sandpiper Present in Sep., Dec. and Feb. with a maximum of 20 in Sep.

Tringa totanus Redshank 1 in Mar.

Tringa erythropus Spotted Redshank 1 in Dec.

Calidris ferruginea Curlew-Sandpiper 1 in Dec., 2 in Feb.

Calidris minuta Little Stint Present on all visits with a maximum of 120 in Feb.

Philomachus pugnax Ruff Present on all visits with up to 300 in Dec., Feb. and Mar.

Himantopus himantopus Black-winged Stilt Present on all visits with a maximum of 80 in Dec.

Recurvirostra avosetta Avocet Present on all visits with 45 in Sep., 180 in Dec., 150 in Feb. and 30 in Mar.

Larus cirrhocephalus Grey-headed Gull 1 in Sep.

Sterna leucoptera White-winged Black Tern 10 in Dec., 3 in Feb.

Columba guinea Speckled Pigeon A few in Sep.

Streptopelia decipiens Mourning Dove A few in all months

Streptopelia vinacea Vinaceous Dove Small numbers recorded only in Feb.

Streptopelia roseogrisea Pink-headed Dove Only in Feb.; a few.

Streptopelia senegalensis Laughing Dove A few recorded on all visits.

Oena capensis Namaqua Dove A few in Sep., Dec. and Feb.



Centropus senegalensis Senegal Coucal 1 in Dec.

Apus affinis Little Swift Only recorded in Sep., when frequent.

Cypsiurus parvus Palm Swift Small numbers seen on all visits.

Merops orientalis Little Green Bee-eater 1 in Sep. only.

Merops albicollis White-throated Bee-eater Only in Sep.; 4 birds.

Merops pusillus Little Bee-eater A few on all visits.

Coracias abyssinica Abyssinian Roller 3-4 in Sep., Dec. and Feb.

Upupa epops Hoopoe 1 in Feb.

Phoeniculus purpureus Green Wood-Hoopoe 2 in Sep.

Tockus nasutus Grey Hornbill Small numbers in Sep. only.

Mesopicos goertae Grey Woodpecker 1 in Feb.

Eremopteryx leucotis Chestnut-backed Sparrow-Lark A few in Sep. only.

Galerida cristata Crested Lark A few on all visits.

Riparia riparia Sand Martin A few in Dec. and Feb.

Hirundo aethiopica Ethiopian Swallow Frequent in Sep. and Dec.

Motacilla flava Blue-headed Wagtail Frequent in Dec., Feb. and Mar.

Motacilla alba White Wagtail 1 in Feb.

Lanius excubitor Grey Shrike 2 in Dec.

Lamprotornis chalybaeus Blue-eared Glossy Starling Small numbers present in Sep. and Feb.

Lamprotornis caudatus Long-tailed Glossy Starling A few in Sep.

Oenanthe oenanthe Wheatear Small numbers in Sep. and Feb.

Myrmecocichla aethiops Ant-eater Chat A few in Sep. and Dec.

Cercotrichas podobe Black Bush-Robin 1 in Feb.

Emberiza tahapisi Cinnamon-breasted Rock Bunting A few in Sep.

Serinus leucopygius White-rumped Seed-eater A few in Feb.

Ploceus velatus Southern Masked Weaver Frequent on all visits.

Ploceus cucullatus Black-headed Village Weaver Frequent, all visits.

Euplectes orix Red Bishop Only recorded in Sep. when frequent.

Bubalornis albirostris Buffalo-Weaver A few in Sep.

Passer griseus Grey-headed Sparrow Frequent on all visits.

Passer luteus Sudan Golden Sparrow Frequent in Feb.

Pytilia melba Green-winged Pytilia 4 in Sep.

Estrilda troglodytes Black-rumped Waxbill A few in all months.

Lagonosticta senegala Red-billed Firefinch Frequent, Dec. and Feb.

Amandava subflava Zebra Waxbill 20 recorded in Feb.

Lonchura malabarica Silverbill Small numbers present in Feb.

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## RINGING IN NIGERIA 1975. 18th ANNUAL REPORT

by R.E. Sharland

Received 5 May 1976

The autumn passage through Kano in 1975 was very good, but condensed in that it started later and ended earlier than usual. Conditions were good for catching wagtails in Kano in the spring, but water levels are now so high that it is doubtful if any further birds can be caught there. This is not a general rise in the water table, but a combination of laterite extraction for house-building with concentrated rains in August 1975.

The dam-building programme of Kano State has reduced the number of places for ringing wagtails. The birds themselves have been much in evidence (see, for instance, p.43). A Levaillant's Cuckoo was trapped in Kano and kept in a bird-bag overnight, when it laid an egg!

Schedule 1. Numbers of Palaearctic species ringed

		1975	Total to date
Little Bittern	<i>Ixobrychus minutus</i>	5	
Squacco Heron	<i>Ardeola ralloides</i>	4	
Teal	<i>Anas crecca</i>	8	
Pintail	<i>A. acuta</i>	1	4
Garganey	<i>A. querquedula</i>	4	100
Shoveler	<i>A. clypeata</i>	1	4
Pallid Harrier	<i>Circus macrourus</i>		1
Quail	<i>Coturnix coturnix</i>		1
Spotted Crake	<i>Porzana porzana</i>	2	3
Ringed Plover	<i>Charadrius hiaticula</i>	2	25
Little Ringed Plover	<i>C. dubius</i>		51
Kentish Plover	<i>C. alexandrinus</i>	1	1
Black-tailed Godwit	<i>Limosa limosa</i>		1
Greenshank	<i>Tringa nebularia</i>	1	10
Marsh Sandpiper	<i>T. stagnatilis</i>		17
Wood Sandpiper	<i>T. glareola</i>	24	492
Green Sandpiper	<i>T. ochropus</i>	4	31
Common Sandpiper	<i>T. hypoleucus</i>	8	179
Redshank	<i>T. totanus</i>		2
Dusky Redshank	<i>T. erythropus</i>		12
Terek Sandpiper	<i>T. terek</i>		1
Common Snipe	<i>Gallinago gallinago</i>	6	51
Great Snipe	<i>G. media</i>		1
Jack Snipe	<i>G. minima</i>	3	19
Curlew Sandpiper	<i>Calidris ferruginea</i>	2	17
Little Stint	<i>G. minuta</i>	48	322

Temminck's Stint	<i>C. temminckii</i>	14
Sanderling	<i>C. alba</i>	1
Ruff	<i>Philomachus pugnax</i>	42 595
Black-winged Stilt	<i>Himantopus himantopus</i>	1 19
Common Tern	<i>Sterna hirundo</i>	1
White-winged Black Tern	<i>S. leucoptera</i>	1
Great Spotted Cuckoo	<i>Clamator glandarius</i>	4
Scops Owl	<i>Otus scops</i>	11
Hoopoe	<i>Upupa epops</i>	14
Wryneck	<i>Jynx torquilla</i>	5 57
Lesser Short-toed Lark	<i>Calandrella rufescens</i>	1
Sand Martin	<i>Riparia riparia</i>	11 1499
European Swallow	<i>Hirundo rustica</i>	1464
House Martin	<i>Delichon urbica</i>	2
Yellow Wagtail	<i>Motacilla flava</i>	643 36982
White Wagtail	<i>M. alba</i>	5 36
Tawny Pipit	<i>Anthus campestris</i>	3
Tree Pipit	<i>A. trivialis</i>	122
Red-throated Pipit	<i>A. cervinus</i>	1 131
Isabelline Shrike	<i>Lanius collurio</i>	4
Woodchat Shrike	<i>L. senator senator</i>	48
Corsican Woodchat Shrike	<i>L. s. badius</i>	1
Golden Oriole	<i>Oriolus oriolus</i>	4
Whinchat	<i>Saxicola rubetra</i>	1 500
Wheatear	<i>Oenanthe oenanthe</i>	26
Black-eared Wheatear	<i>O. hispanica</i>	1
Rock Thrush	<i>Monticola saxatilis</i>	8
Blue Rock Thrush	<i>M. solitarius</i>	1
Redstart	<i>Phoenicurus phoenicurus</i>	17 249
Nightingale	<i>Luscinia megarhynchos</i>	41 325
Bluethroat	<i>L. svecica</i>	4
Cetti's Warbler	<i>Cettia cetti</i>	2
Savi's Warbler	<i>Locustella lusciniooides</i>	6
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	29 1967
Reed Warbler	<i>A. scirpaceus</i>	19 367
Great Reed Warbler	<i>A. arundinaceus</i>	142
Icterine Warbler	<i>Hippolais icterina</i>	1 167
Melodious Warbler	<i>H. polyglotta</i>	14 66
Olivaceous Warbler	<i>H. pallida</i>	2 142
Olive Tree Warbler	<i>H. olivetorum</i>	1
Garden Warbler	<i>Sylvia borin</i>	105 1692
Blackcap	<i>S. atricapilla</i>	24
Whitethroat	<i>S. communis</i>	5 2846
Lesser Whitethroat	<i>S. curruca</i>	2 154
Subalpine Warbler	<i>S. cantillans</i>	6 183
Menetries Warbler	<i>S. mystacea</i>	1
Orphean Warbler	<i>S. hortensis</i>	1
Willow Warbler	<i>Phylloscopus trochilus</i>	54 856
Chiffchaff	<i>P. collybita</i>	5
Bonelli's Warbler	<i>P. bonelli</i>	20

Wood Warbler	P. sibilatrix	15	153
Spotted Flycatcher	Muscicapa striata		281
Pied Flycatcher	Ficedula hypoleuca	12	242
Collared Flycatcher	F. albicollis		23
Ortolan Bunting	Emberiza hortulana		6
	Palaearctic birds	1138	53437
	Ethiopian birds	103	14726
	Total	1241	68163

R.E.Sharland, P.O.Box 342, Kano, Nigeria

ADDITIONAL OBSERVATIONS ON THE BIRDS OF YANKARI GAME RESERVE - Following publication of our list of the birds (Dyer & Gartshore 1975, Bull.Nigerian Orn. Soc. 11: 77-84), we have had the opportunity to visit the Reserve again, from 13 to 19 December 1975. 120 species were recorded then, of which 11 are new, as follows.

Falco biarmicus Lanner A pair was seen daily at Wikki Camp.

Himantopus himantopus Black-winged Stilt A group of three seen along the Gaji River.

Sterna leucoptera White-winged Black Tern A single bird feeding along the Gaji.

Centropus monachus Blue-headed Coucal Up to 10 distributed over about 20 ha of Cyperus swamp.

Merops pusillus Little Bee-eater One mist-netted at the confluence of the Gaji and Wikki streams; also several sight records of individual birds.

Lanius collurio isabellinus Isabelline Shrike One, probably female, being mobbed by a small flock of Euplectes bishops.

Myrmecocichla aethiops Ant-eater Chat One seen in farmland about 1 km north of the Reserve boundary.

Hippolais polyglotta Melodious Warbler }  
H. pallida Olivaceous Warbler }  
Cisticola brachyptera Short-wing Cisticola } One of each species was mist-netted in light bush along the Gaji River.

Vidua chalybeata Indigo-bird One or two seen in several flocks of fire-finches Lagonosticta.

We are grateful to Dr N.M.Gadzama, Department of Biological Sciences, Ahmadu Bello University, who organized the field-trip to Yankari and to Mr A.Lassan, Senior Game Preservation Officer, North-East State, for granting permission to use mist-nets in the Reserve.

Michael Dyer and Mary Gartshore

Dyer & Gartshore (op. cit.) have listed the birds recorded for Yankari Game Reserve. I visited the Reserve on 6-8 February 1971 and 27 March - 1 April 1973, and recorded the following additional species.

Ciconia nigra Black Stork One on the Gaji marshes in 1971. The only other recent records of this species in Nigeria were in Borgu (Walsh 1968, Bull. Nigerian Orn. Soc. 5 (18):50-51) and on the Benue (Fry 1970, Bull. Nigerian Orn. Soc. 7 (25/26: 7-24). Elgood (1975, Bull. Nigerian Orn. Soc. 11: 68-73) listed it as unvalidated, so it is worth stressing that any out-of-season apparent Abdim's Stork C. abdimii should be scrutinised with the present species in mind; in the Sudan Republic I found what had previously been thought of as wintering Abdim's Storks to be all Black Storks.

Sagittarius serpentarius Secretary-Bird Listed by Dyer & Gartshore on the basis of one seen by Elgood just outside the Reserve. I saw one soaring over Wikki Camp in 1973.

Burhinus capensis Dikkop Several in the Reserve in 1973, usually on open, eroded areas. A nest with two eggs was found on bare, gravelly soil near Sir Gawain Bell Falls and photographed.

Himantopus himantopus Black-winged Stilt One on the Gaji marshes in 1971.

Sterna leucoptera White-winged Black Tern Three over the Gaji marshes in 1973.

Clamator levaillantii Levaillant's Cuckoo One at Wikki in 1973 was presumably an early pre-rains migrant.

Apus aequatorialis Mottled Swift 500-600 birds of this species were seen over Wikki on 7 February 1971. They suddenly appeared at 0915 hrs., remained feeding in a rather concentrated flock low over the camp area, with numbers falling off from 1030 hrs onwards until 1115 hrs when all had disappeared. Weather cold, dusty and anticyclonic.

Apus melba Alpine Swift One was with the Mottled Swifts on 7 February 1971. Apart from a single Little Swift A. affinis there were no other species feeding with them.

Buphagus africanus Yellow-billed Oxpecker Seen on Buffalo Syncerus caffer in 1973.

In addition to these records I have also noted Hoopoe Upupa epops breeding on upland areas in February 1971. Antony Pettet

The following species are additional to Dyer & Gartshore's list (op. cit.) of birds of Yankari Game Reserve :

Platalea alba African Spoonbill One on 4 January 1966.

Eurystomus glaucurus Broad-billed Roller One on 31 December 1966.

Ficedula hypoleuca Pied Flycatcher One on 6 January 1966. M. Skilleter

SHIKRA Accipiter badius TAKING BATS - Lizards, small birds, rodents and large insects comprise the main diet of the Shikra, lizards reputedly forming its staple (Brown & Amadon 1968, Eagles, Hawks and Falcons of the World, Vol.2). Observations at Ahmadu Bello University campus, Zaria, suggest that bats may feature importantly in their diet, at least in semi-urban areas.

During the years I lived there (1969-1973) I saw Shikras take small bats on many occasions, all in the dry season or pre-rains period when the bird was generally inconspicuous, present in small numbers and presumably breeding. Bats were also taken by immature Shikras. They were taken almost invariably as they left their roosts in roofs, in the way that Shikras take small birds.

At the house I occupied in 1970-71, Shikras visited the compound daily from November to May. An immature bird missed very few nights over that period and less frequently an adult was also present. They arrived just before dusk, about 1745 hrs, and perched on tall trees near the house waiting for the bats to leave. Bats emerged noisily at irregular intervals in groups of 10 to 30, dropping 0.5-1.5 m as they left holes in the eaves before flying off. During this interval of 'free-fall' the Shikras swooped in, attempting to take the bats before they could fly any distance. More than half of these first attempts were successful. If the Shikra missed it rarely chased the singled-out bat for more than a few metres, being outpaced and outmanoevred by the bats. Since all of the bats usually left the roof in about ten minutes the Shikras rarely had the opportunity for more than three attempts, but there were few nights that were entirely unsuccessful. Captured bats were usually taken away to eat but sometimes birds returned to the vantage tree for the dismembering. The bat population declined conspicuously that season, from 160-200 at the beginning to 30-40 at the end. In other seasons Shikra predation was less regular.

During the dry season of 1972-73 I lived in another house on the campus where bats roosted in a disused chimney, which they left by towering upwards in erratically dispersing groups. This roost was only occasionally preyed upon by Shikras which obviously had a harder task taking these bats, and only occasionally caught stragglers at the end of the emerging groups.

The number of Shikras seen catching bats was small and in different years may have involved the same birds. The sudden termination of bat-catching at the beginning of the rains may reflect the exploitation of alternative foods, or else emigration of the birds concerned. In any event, bat-predation may be more widespread than the lack of records suggests.

Antony Pettet

THE STATUS OF CAPE WIGEON *Anas capensis*, THREE-BANDED PLOVER *Charadrius tricollaris* AND AVOCET *Recurvirostra avosetta* IN NIGERIA - Mackworth-Praed & Grant (1970-73, African Handbook of Birds) give the range of the Cape Wigeon in West Africa as from Nigeria and the Central African Republic to the southern Congo, and its general distribution as from Cameroun and central Abyssinia to South Africa. They say it is not particularly common anywhere. Bannerman (1953, Birds of West and Equatorial Africa) recorded it as having been shot on Lake Chad. Apart from those there are no recent records in Nigeria, although Hopson (1965, Bull. Nigerian Orn. Soc. 1(1): 7-15) recorded 80 on Lake Chad near Nguigmi in Niger in December 1964, and a few were seen at Baga Sola on the eastern side of the lake in December 1969 (Fry 1970, Bull. Nigerian Orn. Soc. 7 (25/26: 7-24)). I have several records of this duck, mostly from a series of potash oases near Bulatura in the extreme north of Borno State in September, December and February (see pp. 35-37), and also from Minetti and Dowoshiram on the south-eastern shore of Lake Chad in November. Records so far suggest a dry-season movement to the north.

The Three-banded Plover is a common species of southern and eastern Africa, but Elgood (1965, Bull. Nigerian Orn. Soc. 1(1):13-25) recorded it as only a rare visitor to Nigeria. Previous records have been in May, August, September, November and December (Sharland 1969, Bull. Nigerian Orn. Soc. 6(21): 32), all in the north of Nigeria, and its exact status has so far been indeterminable.. I have seen up to five together in all months from August to February at boreholes on the south-western shore of Lake Chad (Hall, in press) and at the Bulatura oases on all four of my visits there. Outwith these areas I have a record of one at Lake Alo (near Maiduguri) in June and one near Serti in the south of Gongola State in November. These records suggest a strong northerly movement during the dry season.

Previous records suggest that the Avocet is only a rare visitor to Nigeria, but my records suggest a change of its status. I have records in all months except May, July and August over the whole of the north of Borno State from around Maiduguri (54 at Lake Alo in June), Bulatura oases (up to 180 in December and 45 in September, 150 in February and 30 in March), Minetti borehole (3 in November), Gajibo in eastern Dikwa (2 in November), Malamfatori (up to six in January), Gashua (7 in February), and Malambari on the south-western shore of Lake Chad (11 in February). Elgood, Sharland & Ward (1966, Ibis 108: 84-116) suggested that the increased frequency of records in West Africa as a whole is probably linked with the recent recolonisation of parts of Europe by the species.

The Cape Wigeon, Three-banded Plover and Avocet are all primarily birds of shallow, brackish lakes, and their distribution in Nigeria reflects that. The lack of records of any of these species from southern Nigeria suggests a north-westerly movement into Nigeria during the dry season, and it is my opinion that all three species are non-breeding dry season migrants from their breeding ranges in the east and south of Africa.

P. Hall

FIRST OCCURRENCES OF THE CAPE WIGEON *Anas capensis* IN GHANA - The distribution and biology of the Cape Wigeon, a small dabbling duck found mainly in south and east Africa, have been reviewed recently by Winterbottom (1974, Ostrich 45: 110-132). His records from West Africa refer only to Lake Chad (where he describes it as very rare) and Angola as far north as Luanda. It has, however, been recorded in Nigeria west to Zaria (J.H. Elgood, pers. comm.).

On 11 December 1975 we observed (with P. Greig-Smith) a single Cape Wigeon at close range as it fed on a salt-pan at Weija near Accra, Ghana. The pale plumage mottled and speckled with brown, together with the striking pink and black bill, put the identification beyond doubt. On 8 March 1976 M.A.M. saw another Cape Wigeon under similar circumstances on salt-pans at Iture, about 145 km west of Weija, near Cape Coast. In general appearance it was the same as the Weija bird and the characteristic bill and plumage were clearly seen. Neither bird was seen in flight. It appears that these observations are the first of this species in Ghana, and in the absence of confirmation of a record from Senegambia (Scott, quoted in Winterbottom 1974) are the most westerly records of the species. They fall some 1200 km outside the previously known range.

Although it is possible that both records referred to the same individual despite the distance and lapse of time, that seems improbable. Future visits to the numerous salt-pans and coastal lagoons (which are favoured habitats in the normal range - Winterbottom 1974) on the Ghanaian coast may reveal more accurately the present status of the Cape Wigeon in that area. M.A. Macdonald and I.R. Taylor

#### COMMENTS ON "THE NORTHERN LIMITS OF FRINGING FOREST BIRDS..."

Sir ,

With reference to Fry's article in Bulletin 11(40): 56-64 (1975), whilst the 30 species listed may be virtually confined in the dry season to the 'dark tunnel' kurmis, in March and early April there is no such exclusivity. In Kaduna I have records of Paradise Flycatchers, White-crowned Robin-Chats, Snowy-headed Robin-Chats and Wood Owls in gardens in late March and early April. This is not to say that they are not more common later : they are. As regards Pied Flycatchers, they are occasionally seen in the dry bush around Kaduna in the dry season. Mr R.E. Sharland and I watched one in late December 1965, and I have a Kaduna garden record for January 1966.

M. Skilleter  
12, Westcliffe Rd.,  
Roker, Sunderland, U.K.

#### DYE-MARKED KNOTS, SANDERLINGS AND CURLEW-SANDPIPER

Large numbers were marked early this year in South Africa for a migration study. Will any-one seeing a dyed bird please note the colour and position of the dye and give full details to A.J. Prater, British Trust for Ornithology, Beech Grove, Tring, Herts, U.K. or to Dr R.W. Summers, Percy FitzPatrick Institute of African Ornithology, University of Cape Town, South Africa.

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NOTICE TO CONTRIBUTORS

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The BULLETIN publishes papers, short notes, reviews, letters and illustrative material. Contributions should be typed on one side of the paper with double spacing and wide margins. Wherever possible papers should have first been submitted to at least one ornithologist or biologist for critical scrutiny.

Written contributions will be retyped for offset printing, but FIGURES should be prepared as for final reproduction, allowing for 20 percent reduction, using Indian ink on good quality white paper, Letraset and Letratone lettering and shading (or equivalent) as appropriate.

CONVENTIONS regarding tabular material, dates, numbers, metric values, references etc. should be carefully adhered to and can be sought in this and recent issues of the Bulletin.

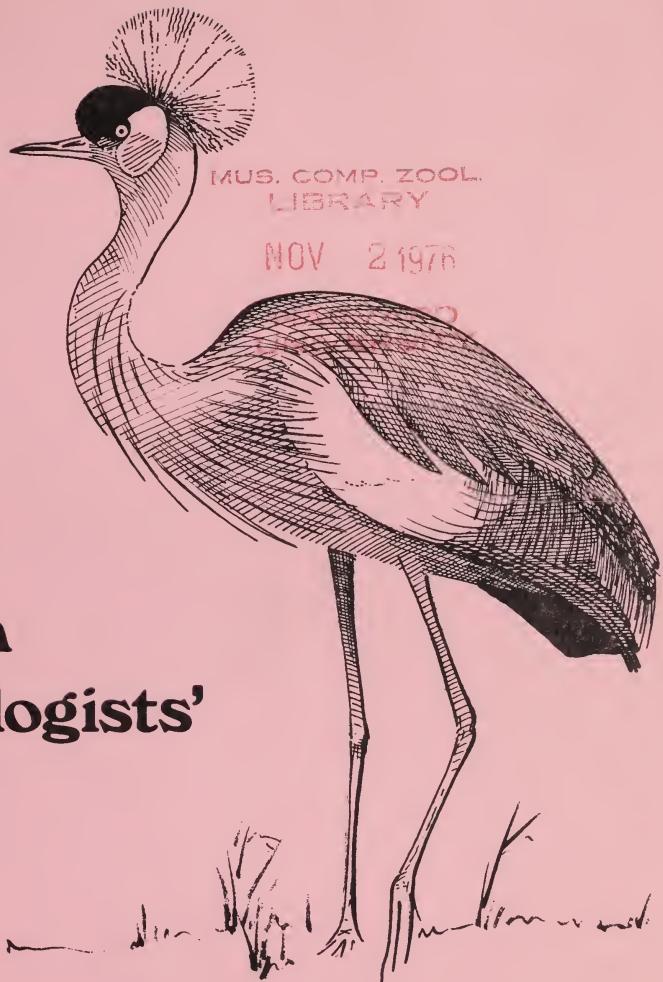
Pending standardisation, English and scientific bird NAMES should follow Mackworth-Praed & Grant, African Handbook of Birds, Ser. 3 Vols. 1 and 2 (1970,1973). Bannerman's scientific names (Birds of West and Equatorial Africa, Vols. 1 and 2 (1953)), should be given in parenthesis if they differ from Praed & Grant's. See also Vol.11 (1975) p. 55.

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C.H.Fry

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**Nigerian  
Ornithologists'  
Society**

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- to Prof. B. J. Harris (Department of Biological Sciences, Ahmadu Bello University, Zaria, Nigeria) regarding purchase of back numbers of the BULLETIN, and all other matters

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# Nigerian Ornithologists' Society

## Bulletin

Vol. 12 No. 42 , October 1976

### ON THE FUNCTION OF RICTAL BRISTLES, WITH REFERENCE TO NIGERIAN BIRDS

by M. Dyer

Received 19 March 1976

The variation in size and shape of the rictal bristles of birds raises some obvious questions as to their function. Many aerial insectivorous species have rather long and conspicuous rictal bristles, suggesting to Mayaud (1950) that for nightjars, they might help catching insects by acting as a 'net' on either side of the bird's gape. In crepuscular, nocturnal and hole-nesting species, rictal bristles may have tactile functions like those of mammalian vibrissae (Klüster 1905). Lederer (1972) analysed film of tyrant-flycatchers catching insects, but was unable to draw any conclusions about the role of rictal bristles in prey capture by these birds. In a review of avian bristles Stettenheim (1974) pointed out some inconsistencies in the pattern of occurrence of rictal bristles in several Orders and Families.

From detailed observations of a captive Black-headed Bush-shrike *Tchagra senegala*, it became evident to me that rictal bristles might function to protect the eyes of birds that feed on potentially harmful insects. In December 1974 I had the opportunity to watch at very close range at Zaria, Nigeria, an injured Black-headed Bush-shrike feeding on large acridid grasshoppers. Several times I fed the shrike live specimens 6 cm long of *Acanthacris*, which possess formidable-looking tibial spines on the hind legs. When one of these grasshoppers was taken by the shrike, the insect would strike at the bird's face with its legs. However, the kicking hind legs of *Acanthacris* were deflected away from the shrike's eyes by the stiff rictal bristles along the bird's gape, and I was impressed by the way these bristles had diverted possible injury to the shrike.

If species of large-billed insectivorous bird incorporate into their diets insects capable of inflicting injury on the eyes, then it is reasonable to suppose that selection would favour the evolution of rictal bristles of a type which, among other functions, would reduce such injuries. To see if there was any relationship between birds' rictal bristles and diets, I examined skins of several species of large-billed insectivorous birds, chosen on the basis of my having observed them in the field feeding on large-bodied insects.

The more conspicuous large-billed insectivorous birds whose feeding habits are readily observable, at least in northern Guinea savanna, are the Grasshopper-Buzzard Butastur rufipennis, Abyssinian Roller Coracias abyssinica, two or three species of bee-eaters Merops, and several of shrikes (particularly the Yellow-billed Shrike Corvinella corvina).

The Grasshopper-Buzzard commonly attends bush fires and at such times becomes quite gregarious. If the fire is by a road, the birds will often sit and wait on the asphalt and pounce on any grasshopper, cricket or mantid that happens to land nearby (personal observation). Presumably this tactic allows the Grasshopper-Buzzards to feed on insects which have little chance of escaping by taking cover in vegetation.

The rictal bristles of Butastur are relatively fine and short, and would hardly seem effective in preventing a grasshopper's hind legs from striking the bird's eyes. However, the method of insect-capture by Grasshopper-Buzzards reveals that rictal bristles need not have evolved to function as "eye protectors". Like most, if not all, insectivorous falconiforms, Butastur catches prey with its feet (Brown 1970). This means that large, potentially harmful insects can be immobilized before they come near the facial region of the bird. For birds of prey, Chandler (1904) suggested that bristles in the facial (loral) region were modified to prevent wearing or soiling of otherwise conventional feathers.

In common with its congeners, the Abyssinian Roller is a sit-and-wait hunting strategist. The coraciiform foot is not adapted for grasping prey, and prey catching is done with the bill. From its vantage point a roller will swoop down to the ground to pick up prey, often landing beside an insect before actually seizing it. Rollers seem to specialise on large bugs and beetles (Orthoptera, Coleoptera) (Mackworth-Praed & Grant 1970), and their relatively large heads and bills seem well suited to the task.

In contrast with Butastur, the rictal bristles of C. abyssinica are quite thick and stiff, and in the manner that they curve away from the eyes are similar to the bristles of Tchagra senegala. Thus it is reasonable to assume that the rictal bristles of C. abyssinica and T. senegala perform similar functions.

Bee-eaters catch insects on the wing and bring each item caught to a perch where it is usually immobilized before being swallowed. Fry (1973) analysed the diets of savanna living species and found that the Carmine Bee-eater Merops nubicus shows a predilection for acridid grasshoppers. Since large insects are immobilized, and since the bills of bee-eaters are long and can thus keep harmful insects away from the facial region, it is interesting to speculate as to the function of bee-eater rictal bristles. Fry (ibid) provided circumstantial evidence that some bee-eaters, including M. nubicus, catch and swallow venomous Hymenoptera on the wing. It is not known how these insects are caught, but if they were caught in the bill near the gape, there is serious risk of the bird being stung in or around the eye. I suggest that the rictal bristles of the Carmine and other aerially feeding bee-eaters serve to protect the eyes from venomous insects during flight, as well as having an equally important function in directing food into the gape.

The Yellow-billed Shrike Corvinella corvina possesses rather long and stiff rictal bristles, but not curved as in T. senegala. Mackworth-Praed & Grant (1973) state that its diet includes fruit and lizards in addition to insects. As with Coracias abyssinica, shrikes normally catch their prey with their bills. The fruit and flesh in the diet of Corvinella may explain the relatively long rictal bristles of this species in that they protect the feathers of the face from becoming soiled or worn (as well as protecting the eyes).

The interpretation of the above findings must be viewed with extreme caution. I have examined only a few species of large-billed insectivorous bird, and there are few substantive data to support my view that rictal bristles may function to protect eyes. However it does appear that the inconsistent pattern of occurrence of rictal bristles in birds may reflect variation in feeding methods as well as in diet, even within the same Family.

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THE COMPOSITION AND HABITAT PREFERENCES OF THE AVIFAUNA  
OF MOLE NATIONAL PARK, GHANA

by P. W. Greig-Smith

Received 15 March 1976

Mole National Park covers almost 5000 km<sup>2</sup> in the Northern Region of Ghana, in the centre of the Guinea savanna belt. With the exception of game-scouts' camps, the Park has been uninhabited since 1964, and is much less disturbed than most areas of savanna woodland in West Africa. As a result of the excellent tourist accommodation, the Park attracts large numbers of visitors, and several bird lists have been compiled. Three accounts have been published (Genelly 1969, Maze 1970, Oxford Expedition Report 1970), but none includes observations from more than a few months, and no full list has been produced.

This paper draws together the available records from Mole, forming an up-to-date bird list for the Park. The migrant status, relative abundance, and habitat preferences of species are discussed, based on my own observations at Mole (7 July to 28 August 1974; 3 July to 3 September 1975; 28 October to 3 December 1975), chiefly in the vicinity of the Park headquarters, 09° 16'N 01° 51'W, and Lovi Camp, 09° 23'N 02° 00'W.

#### DESCRIPTION OF HABITATS

The area is topographically uniform, varying from 120 to 490 metres above sea level, and relieved only by a network of low scarps. The vegetation associations are typical of the West African Guinea Savanna zone, described by Keay (1953) and Hopkins (1965). For the purpose of the following analysis, I have divided the bird habitats into nine broad types :

1 Human settlements The surroundings of the game-scouts' camps and the HQ buildings are distinguished from the adjacent savanna by their lower tree density, mown grass, and continual human disturbance. They also contain small gardens planted with a variety of crops.

2 Water edge This includes the surface and immediate surroundings of (i) the larger rivers, (ii) the transient pools which form during the rains in savanna and grassland, and (iii) permanent water-holes, particularly two artificial pools formed by dams near to the tourist motel.

3 Marsh Marshes are generally associated with rivers and water-holes, and though completely waterlogged in the rainy season, they dry out almost totally by the late dry season. The vegetation comprises grasses and sedges, 1 - 1.5 metres high, often with bushes of Mitragyna inermis and Pterocarpus santalinoides at the fringes.

4 Bovals Where soil cover is thin, the savanna gives way to flat treeless areas, bearing a layer of short herbs and grasses. Ephemeral pools form in the rainy season, as a result of inadequate drainage (no bird records from such pools are included, however). Fingers of woodland extending into the bovals are denser than the neighbouring savanna, by virtue of their protection from the worst of the annual fires.

5 Riverine woodland The larger rivers are fringed by a narrow strip of forest, composed of dense undergrowth and a closed canopy of tall emergent trees. Within the forest illumination is low and humidity is high. The vegetation is not affected by annual grass burning, and the undergrowth remains green throughout the year.

6 Anogeissus groves The sites of abandoned villages are marked by almost unispecific stands of the tree Anogeissus leiocarpus, which forms a higher, more closed canopy than in the savanna. Baobab trees Adansonia digitata are generally present, and the grass layer is not well developed.

7 Guinea savanna This is by far the predominant habitat at Mole, occurring in large unbroken areas separating relatively small patches of the other habitats. The open tree canopy is up to about 12 metres in height, over a grass layer which reaches 2.5 metres by the end of the rainy season. The common tree species include Isoberlinia doka, Butyrospermum paradoxum, Burkea africana, and Combretum spp.. Tree density and grass cover are reduced on the eroded slopes of scarpas, and greater than average in areas close to streams. Annual burning in the dry season destroys the grass, and if severe can damage the trees.

8 Acacia scrub Small areas of arid, stony ground occur in savanna, particularly at the foot of the scarpas. They are dotted with low thorny bushes, chiefly Acacia spp., and have no grass layer.

9 Grassland This differs from typical savanna in the virtual absence of trees, and occurs where soil cover is moderately thin. It is an intermediate category along a continuum between Guinea savanna and bovals.

#### THE SPECIES

Appendix 1 lists 314 species which have been seen at Mole during the last 12 years. Doubtful records of 21 birds have been omitted where the following three conditions are fulfilled : (i) identification seems

doubtful for distributional reasons, (ii) the species is easily confused in the field with a species already known to occur, (iii) the species has been recorded by only one (or rarely two) observers.

A rough index of abundance has been assigned to those species encountered during my visits, giving 43 species with abundance rating 1 : irregular, 83 with rating 2 : rare, 92 with rating 3 : common, and 31 with rating 4 : abundant.

Migrant status has been indicated for all species. This is based principally on the pattern of occurrence of species at Mole, but also takes account of established migration patterns, as described by Moreau (1966), Mackworth-Praed and Grant (1970, 1973), and Elgood, Fry & Dowsett (1973). The category 'intra-African migrant' here includes some species which may be involved in only local movements, as well as those with long-distance migrations.

#### HABITAT PREFERENCES

Appendix 1 also records the habitats occupied by 230 species observed during my visits, and indicates the apparently preferred habitat in each case. Most species (151 out of 230) are restricted to one or two habitats, and only four (*Crinifer piscator*, *Centropus senegalensis*, *Pycnonotus barbatus* and *Eremomela pusilla*) occur in more than five. However, this is not necessarily a good indication of the number of species with specialised habitat requirements, since some of the nine habitat-types include a considerable variety of sub-divisions.

The habitat-occupancy data are summarised in Table 1, indicating the diversity and uniqueness of the communities. Guinea savanna harbours almost twice as many species as any other habitat, none of which have more than one third of the total. The bovals appear to have a very impoverished bird fauna. The most distinctive communities, as measured by the proportion of species unique to the habitat, are those in marshes, water edge, and bovals, although all three share more than 60% of their species with other habitats. Four habitats (water edge, marsh, riverine forest and Guinea savanna) account for 82% of the species which are restricted to a single habitat.

In order to demonstrate relationships between the nine communities, an ordination was carried out on the habitat-occupancy data. The method used was that of Reciprocal Averaging (Hill 1973), which has the advantage of providing comparable species and stand (i.e. habitat) ordinations. The results will be discussed fully elsewhere, but one stand ordination is presented in Figure 1, to demonstrate similarity in species-composition between habitats. The figure shows the two axes of greatest variation of a three-dimensional graph on which the distance between two habitats is inversely related to the similarity of their species-lists.

Table 1. Composition of the bird communities in Mole National Park

Habitat	Number of species recorded	Number of spp. preferring the habitat	Number unique to the habitat	
			%	%
Human settlements	43	13 (32)	5	(12)
Water edge	31	7 (23)	12	(39)
Marsh	71	31 (44)	19	(27)
Bovals	9	6 (67)	3	(33)
Riverine forest	70	39 (56)	15	(21)
<u>Anogeissus</u> groves	29	1 (3)	1	(3)
Guinea savanna	131	76 (58)	20	(15)
<u>Acacia</u> scrub	63	12 (19)	3	(5)
Grassland	67	13 (18)	2	(3)

## DISCUSSION

The species-total for Mole of 314 is very similar to totals recorded at two other well-studied Guinea savanna areas, in Gambia (300 species, Moreau 1966) and Nigeria (329 species, Fry 1966). Further, species-composition is closely similar to several localities in the Guinea savanna belt in Nigeria. The number of species shared with Mole, expressed as a percentage of the lower species-total, is 87% for Zaria,  $11^{\circ} 10'N$   $7^{\circ} 40'E$  (Fry 1966); 88% for Yankari,  $9^{\circ} 45'N$   $10^{\circ} 20'E$  (Dyer and Gartshore 1975); and 95% for both Falgore,  $11^{\circ} 14'N$   $8^{\circ} 12'E$ , and Shagunu,  $10^{\circ} 20'N$   $4^{\circ} 29'E$  (personal observation). Many of the differences are attributable to the restricted ranges of species which do not extend as far west as Mole, or to the presence of different habitats (e.g. the lake at Shagunu). Such close correspondence reflects the uniformity of the Guinea savanna zone in West Africa, and suggests that deductions made from observations at Mole are likely to be applicable to any Guinea savanna locality.

A large proportion of the species-differences which are not obviously a result of restricted ranges or absence of habitats involve water-birds (Ardeidae, Ciconiidae, Anatidae, Charadriidae, and others) or birds of prey (Accipitridae and Falconidae). Together with the swifts and swallows, these groups are also the least predictable at a single

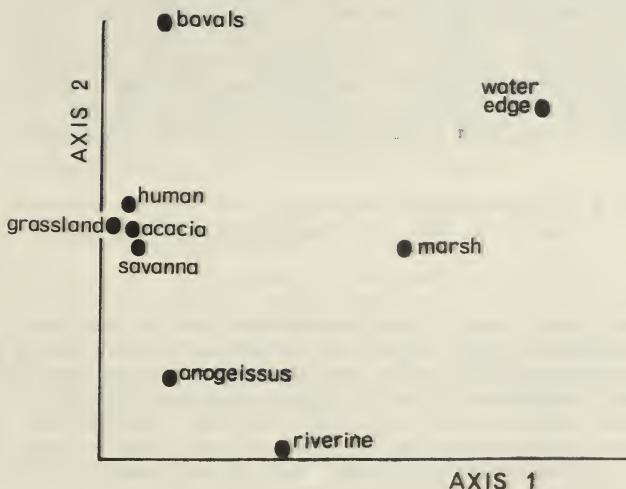


Figure 1. Relationship between the bird communities of nine habitats in Mole National Park, indicated by an ordination of the habitat preferences of 218 species.

locality - for example, no observer at Mole has recorded more than 60% of the total number of birds of prey in Appendix 1, nor more than 55% of the larger water-birds. This demonstrates the irregular, wide-ranging habits of the water-birds, constituting an adaptation to the extreme seasonal fluctuation in the extent and location of open water. The apparent unpredictability of the birds of prey may similarly reflect migrations and wanderings, but also indicates the large ranges required by individuals, and consequent low population densities.

The numbers of species recorded on each of my three visits to Mole were very similar (178, 191, and 194), and no other observers have certainly recorded more than 204 birds. Thus it seems that the number of species present at any time is about 200, so species-composition must change substantially by seasonal immigration and emigration. This accords with the large number of migrants (43 Palaearctic species, and 81 African species) included in Appendix 1.

The abundance index, although very imprecise, indicates that only a small proportion (about one eighth) of the species are abundant. Many of these are seed-eating passersines whose food becomes seasonally superabundant when the grasses flower in the early dry season. It is of interest that several species (e.g. Poicephalus robustus, Salpornis spilonota, and Emberiza cabanisi) which are rare and local in Nigeria (C. H. Fry, pers. comm.) are regular or common at Mole. This is probably a reflection of the lack of agriculture and other major human disturbance.

Consideration of species-composition within the various habitats (Appendix 2; Fig. 1) identifies four principal types of bird community :

(a) Savanna birds

This includes not only the birds of the true Guinea savanna, but also those of human settlements, Acacia scrub, and grassland, each of which has very few unique species (less than 12%), and shares over 75% with Guinea savanna. The closeness of this relationship is attributable mainly to the general similarity of vegetation structure in the four habitats. The lack of some components, such as a grass layer in the Acacia scrub, or a tree canopy in grassland, reduces species-diversity in these habitats, although it also permits the addition of a few species not found elsewhere. It is likely that the distribution of the habitats also promotes a general similarity to Guinea savanna. The other habitats occur as small patches within a matrix of savanna, which birds must occupy at least temporarily unless they are extremely sedentary. This applies also to the bovans and Anogeissus groves, and is probably a major contributor to the number of species that these structurally very different habitats share with Guinea savanna.

Five species appear to be restricted to the vicinity of human settlements. In some cases this is probably a result of the small number of records, but Lamprotornis spp. and Corvus albus are associated with urban areas throughout West Africa, and it may be that they would not occur at Mole in the absence of man. Despite human disturbance, several other species have shifted their habitat preferences to settlements, although also occurring elsewhere.

(b) Riverine Forest birds

Of the 15 species which are restricted to riverine forest, all but two are included in a list of 'fringing forest' species of the Guinea savanna zone in Nigeria (Fry 1975). Their distributions are all largely within the forest belt to the south of the savannas, where their habitat preferences are less rigid, and they extend into the drier savannas only along riverine forest. It is likely that several other species in Appendix 1 are also in this category, but are able to occupy adjacent habitats during the rains, when the environment is less arid and lacking in cover. There is apparently a general movement of birds into the riverine forest at the height of the dry season (Maze 1970).

The Anogeissus grove community shows considerable similarity to riverine forest as well as to savanna. This is attributable to the similarities in vegetation structure - both habitats have a high, closed tree canopy - and to the fact that the natural location of A. leiocarpus is along river banks. The presence of several otherwise riverine forest birds (Halcyon malimbicus, Cossypha niveicapilla, Turdus pelios, Camaroptera brachyura, Myioparus plumbeus, and Terpsiphone viridis) suggests that low illumination and relatively high humidity are more important habitat requirements for them than dense cover, which is much less plentiful in Anogeissus groves than in riverine forest.

#### (c) Water and Marsh birds

Though not closely similar to one another, these two communities are distinct from all others, reflecting their quite different physical structure. The lack of similarity between them is due to the fact that marsh includes not only birds associated with water, but also a number of species (e.g. Euplectes spp., Cisticola galactotes and C. natalensis, Merops pusillus, Tchagra minuta, Quelea erythrops) which occupy the grass and sedges. The wandering habits of water-birds have already been mentioned, and described as an adaptation to the ephemeral nature of open water sites. The water-living marsh birds are also subject to this pressure, but it is likely that they move only when compelled to do so by extreme drying-out.

#### (d) Boval birds

Bovals hold the best-defined bird fauna. This is a result of the specialisations needed to occupy a habitat which lacks cover, and is subject to extremely high temperatures and low humidity. Thus only a small number of species (Vanellus senegallus, Charadrius forbesi, Mirafra rufocinnamomea, Galerida cristata, Anthus leucophrys) occur on the flats themselves. The ephemeral pools temporarily attract water-birds, and the fingers of woodland dividing the flats contain a number of species which are usually associated with riverine forest and the denser patches of savanna trees (Camaroptera brachyura, Platysteira cyanea, Lybius dubius, and Turdoides plebejus). The nearest relationship of the boval community is with human settlements, explained by the closely mown grass which surrounds the camps.

No habitat preferences were determined for the swifts (Apodidae) and swallows (Hirundinidae), because of their high mobility, and virtual independence of vegetation. The occurrence of these species was very unpredictable, in location, time and number of birds. Large flocks of up to four species frequently and suddenly arrived to feed on insects over open water and marshes.

Finally, it seems useful to attempt a synthesis of the migration and breeding patterns, and the habitat preferences of species. The following scheme summarises the major elements comprising the avifauna of Mole National Park:-

Resident savanna birds, breeding at Mole, and occupying the full range of habitats described above. They may or may not have their populations augmented seasonally by migrant sections of the species.

Birds of the drier or wetter savanna, not breeding at Mole, and present only for a part of the year, as they migrate with the movement of the inter-tropical convergence and the associated rains.

Riverine forest birds near the limits of their southern forest distributions.

Birds associated only with human settlements, and presumably occurring because of the presence of man.

Resident marsh and water-birds which are restricted to marshes throughout their ranges.

Water-birds indulging in local wanderings related to changes in areas of open water.

Palaearctic migrant species, of various ecological types, which are non-breeding visitors in the dry season.

#### Acknowledgements

I wish to thank E. O. A. Asibey and the Ghana Game and Wildlife Department for permission to study birds at Mole, and for the excellent facilities provided. I am grateful to N. C. Davidson and R. B. Payne for allowing me to quote their observations, and to C. H. Fry for commenting on some doubtful records. The computing of the ordination was done by J. A. Fettes, and I am indebted to P. Greig-Smith for advice on the choice of an ordination technique, as well as his critical reading of the manuscript. The study was financed by grants to the first and second Aberdeen University Ghana expeditions from the Royal Society, The Carnegie Trust, Aberdeen University, and the Explorers Club.

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#### APPENDIX 1 - BIRDS RECORDED FROM MOLE NATIONAL PARK

Sequence and nomenclature follow White (1960-65).

Status : R, resident whole year; AM, intra-African migrant; PM, Palaearctic migrant.

Abundance : Index assigned only to species recorded by the author and N.C. Davidson during 1974 and 1975 Aberdeen University expeditions.

1, irregular (occasional records of one or two birds); 2, rare (seen regularly in small numbers); 3, common (recorded frequently in moderate numbers); 4, abundant (recorded frequently in large numbers).

Habitats : + indicates habitats in which the species was recorded; \* indicates the preferred habitat, judged by the high proportion of records there. Only species seen by the author are considered, and the highly mobile swifts and swallows are ignored. No preference is given for species with abundance rating of 1.

Authority : Records are by the author unless indicated by the following symbols :

D - N.C. Davidson, July-Sept 1974 and July-August 1975  
 EG - M. Edmunds and L. Grimes, March 1969  
 G - R.E. Genelly, July-Oct 1966  
 M - R.L. Maze, Jan, April and August 1967 and 1968  
 O - Oxford University expedition, July-Sept 1968  
 P - R.B. Payne, October 1975  
 S - R. Sutton, December 1968  
 skin - study-skin deposited at Mole, examined by the author  
 T - game rangers  
 X - combined records of J. Edwards (Aug 1964); K.J. McAdam (Dec 1964); K. Curry-Lindahl (March 1968); P. Pegg (March-Aug 1968).

## HABITATS

SPECIES	STATUS	ABUNDANCE	HABITATS							AUTHORITY
			Human	Water	Marsh	Bovals	Riverine	Anogeissus	Savanna	
<i>Ardea cinerea</i>	AM+PM	2	+	*						
<i>A. melanocephala</i>	AM	1	+	+						
<i>A. goliath</i>	AM									EG O
<i>A. purpurea</i>	AM+PM	2	+	*						
SCOPIDAE										
<i>Scopus umbretta</i>	R	2	*	+						
CICONIIDAE										
<i>Ciconia ciconia</i>	PM									skin
<i>C. abdimii</i>	AM									M
<i>C. episcopus</i>	AM	1		+						
<i>Ephippiorhynchus senegalensis</i>	AM	1		+						
<i>Anastomus lamelligerus</i>	AM									EG X
<i>Leptoptilus crumeniferus</i>	AM	1		+						
<i>Ibis ibis</i>	AM									M O
THRESKIORNITHIDAE										
<i>Threskiornis aethiopica</i>	AM									O
<i>Bostrychia hagedash</i>	R	3	+	*			+			
ANATIDAE										
<i>Dendrocygna viduata</i>	R	3	*	+						
<i>Alopochen aegyptiaca</i>	AM									G
<i>Plectropterus gambensis</i>	R	2		*						
<i>Sarkidiornis melanotus</i>	AM									M
<i>Nettapus auritus</i>	R									O
ACCIPITRIDAE										
<i>Trigonoceps occipitalis</i>	R	1						+	+	
<i>Gyps bengalensis</i>	R	1						+	+	
<i>Neophron monachus</i>	R	3	*					+	+	
<i>Gypohierax angolensis</i>	R	2			*			+		
<i>Polyboroides radiatus</i>	R	1			+					
<i>Terathopius ecaudatus</i>	R	3	+					*	+	
<i>Circaetus gallicus</i>	PM									EG
<i>C. cinereus</i>	R									P O
<i>C. cinerascens</i>	R	1		+						
<i>Accipiter toussenelii</i>	R				+					EG G P
<i>A. badius</i>	AM	2		+				*	+	
<i>Melierax metabates</i>	R									EG O
<i>M. gabar</i>	R	2		+			+	*		
<i>Kaupifalco monogrammicus</i>	R	3						*		
<i>Butastur rufipennis</i>	AM	2						*		
<i>Buteo auguralis</i>	AM	2		+				+	+	
<i>Lophoæetus occipitalis</i>	R	1		+	+					
<i>Polemaetus bellicosus</i>	R	2						*		
<i>Hieraæetus spilogaster</i>	R?									
<i>H. dubius</i>	R?									
<i>Aquila rapax</i>	R									EG
<i>A. wahlbergi</i>	R	2	+	+				*		O
<i>Haliaetus vocifer</i>	R	3	+	*	+					





SPECIES	STATUS	ABUNDANCE	HABITATS							AUTHORITY
			Human	Water	Marsh	Bovals	Riverine	Anogeissus	Savanna	
<b>CAPRIMULGIDAE</b>										
<i>Caprimulgus inornatus</i>	AM									EG O
<i>C. climacurus</i>	R	2								
<i>Macrodipteryx longipennis</i>	AM	1								
<b>APODIDAE</b>										
<i>Apus apus</i>	PM	1								
<i>A. caffer</i>	AM	1								
<i>A. affinis</i>	AM	3								
<i>Cypsiurus parvus</i>	R	4								
<i>Chaetura ussheri</i>										GO
<b>COLIIDAE</b>										
<i>Colius striatus</i>	R	2								
<b>ALCEDINIDAE</b>										
<i>Ceryle maxima</i>	R	2								
<i>C. rufidorsa</i>	AM	1	+	+						
<i>Alcedo quadribrachys</i>	R	2	+							
<i>A. cristata</i>	R	2	*							
<i>Ceyx picta</i>	R	3	+	+						
<i>Halcyon senegalensis</i>	AM	2	*	+						
<i>H. malimbica</i>	R	3	+	*						
<i>H. chelicuti</i>	R	3	+	*	+					
<i>H. leucocephala</i>	AM	2	*							
<b>MEROPIDAE</b>										
<i>Merops apiaster</i>	PM									P
<i>M. orientalis</i>	AM?									M
<i>M. malimbicus</i>	AM									O
<i>M. nubicus</i>	AM									EG O M S skin
<i>M. albicollis</i>	AM	3	+							
<i>M. pusillus</i>	R	2	*	+						
<i>M. bullocki</i>	R	4	+							
<i>M. hirundineus</i>	R	2	*							
<b>CORACIIDAE</b>										
<i>Coracias abyssinica</i>	AM	3	+							*
<i>C. naevia</i>	AM	1								
<i>C. cyanogaster</i>	AM	1								
<i>Eurystomus glaucurus</i>	R	3	*							
<b>UPUPIDAE</b>										
<i>Upupa epops</i>	AM+PM?									EG S X
<i>Phoeniculus purpureus</i>	R	3			+	+	*			
<i>P. aterrimus</i>	R	2				+	*			
<b>BUCEROTIDAE</b>										
<i>Tockus nasutus</i>	AM	4	+							
<i>Bucorvus abyssinicus</i>	R	2	*							
<b>CAPITONIDAE</b>										
<i>Lybius dubius</i>	R	3	+							
<i>L. vieilloti</i>	R	2								
<i>Pogonius chrysococcyx</i>	R	2	+							

## HABITATS

SPECIES	STATUS	ABUNDANCE	HABITATS							AUTHORITY
			Human	Water	Marsh	Bovals	Riverine	Anogeissus	Savanna	
<b>ORIOLIDAE</b>										
<i>Oriolus auratus</i>	AM	3							*	+
<b>DICRURIDAE</b>										
<i>Dicrurus ludwigii</i>	R	2				*				
<i>D. adsimilis</i>	R	3				+	+	*		+
<b>STURNIDAE</b>										
<i>Lamprotornis purpureus</i>	R	3	*						+	
<i>Lamprotornis chalcurus/chalybeus</i>	AM	2	*						+	
<i>Cinnyricinclus leucogaster</i>	AM	1							+	
<i>Buphagus africanus</i>	R	3			*					
<b>CORVIDAE</b>										
<i>Ptilostomus afer</i>	R	2				*				
<i>Corvus albus</i>	AM	2	*							
<b>CAMPEPHAGIDAE</b>										
<i>Coracina pectoralis</i>	R	2						*		+
<i>Campephaga phoenicea</i>	R	3			+			*		
<b>PYCNONOTIDAE</b>										
<i>Pycnonotus barbatus</i>	R	4	+	+		+	+	*	+	+
<i>Chlorocichla flavicollis</i>	R	2				*				
<b>MUSCICAPIDAE (Turdinae)</b>										
<i>Saxicola rubetra</i>	PM									
<i>Cercomela familiaris</i>	R	2						*		
<i>Myrmecocichla albifrons</i>	R	2						+	*	
<i>Phoenicurus phoenicurus</i>	PM									
<i>Cossypha albicapilla</i>	R	3				*				
<i>C. niveicapilla</i>	R	3				*	+			
<i>Luscinia megarhynchos</i>	PM									
<i>Turdus pelios</i>	R	3				*	+	+		
<b>MUSCICAPIDAE (Timaliinae)</b>										
<i>Turdoides plebejus</i>	R	3				+				
<i>T. reinwardtii</i>	R	3				*		*		
<b>MUSCICAPIDAE (Sylviinae)</b>										
<i>Acrocephalus scirpaceus</i>	PM	1			+					
<i>A. rufescens</i>	R									
<i>Sphenoeacus mentalis</i>	R	3								+
<i>Hippolais polyglotta</i>	PM	2					*			
<i>Sylvia borin</i>	PM	3						*		
<i>S. communis</i>	PM	2						+		
<i>Phylloscopus trochilus</i>	PM	3					+	*		
<i>Cisticola erythrops</i>	R	2				*		+		
<i>C. cantans</i>	R									
<i>C. lateralis</i>	R	3				*		+		
<i>C. aberrans</i>	R									
<i>C. galactotes</i>	R	3			*					
<i>C. natalensis</i>	R	4			*					
<i>C. ruficeps</i>	R	1						+		

## HABITATS

SPECIES	STATUS	ABUNDANCE	Human Water	Marsh	Bovals	Riverine	Anogeissus	Savanna	Acacia	Grassland	AUTHORITY
<i>C. brachyptera</i>	R	4						*		+	
<i>C. rufa?</i>	R	3						*		+	
<i>Prinia erythroptera</i>	R	3								*	
<i>P. subflava</i>	R	4						*		+	
<i>Apalis flavida</i>	R?										EG
<i>Hypergerus atriceps</i>	R	2				*					
<i>Camaroptera brachyura</i>	R	3				*	+				
<i>Eremomela pusilla</i>	R	4	+	+			+	*	+	+	
<i>Sylvietta brachyura</i>	R	3						*	+		
MUSCICAPIDAE (Muscicapinae)											
<i>Muscicapa striata</i>	PM										P
<i>M. aquatica</i>	R	2		*	+		+				
<i>Myioparus plumbeus</i>	R	2					*	+			
<i>Ficedula hypoleuca</i>	PM	3					+	+	+	*	
<i>Melanornis edoloides</i>	R	3			+		+	+	*	+	
<i>Bradornis pallidus</i>	R	3	*					+	+	+	
<i>Hyliota flavigaster</i>	R	2						+	*		
<i>Batis senegalensis</i>	R	3						*	+		
<i>Platysteira cyanea</i>	R	3				*					
<i>Trochocerus longicauda</i>	R	3				*					
<i>Terpsiphone viridis</i>	R	3				*	+	+			
PARIDAE											
<i>Parus leucomelas</i>	R	3	+						*	+	+
REMIZIDAE											
<i>Remiz parvulus</i>	R	3						+	+	*	+
SALPORNITHIDAE											
<i>Salpornis spilonota</i>	R	2						*			
NECTARINIIDAE											
<i>Anthreptes longuemarei</i>	R	1						+	+		
<i>A. platura</i>	AM	3						*	+	+	
<i>Nectarinia verticalis</i>	R	2					*				
<i>N. senegalensis</i>	R	4	+					*	+	+	
<i>N. venusta</i>	R	1			+		+				
<i>N. cuprea</i>	R	4		*					+	+	+
<i>N. cocciniigaster</i>	R	3	*		+				+	+	
<i>N. pulchella</i>	R	4		*							
ZOSTEROPIDAE											
<i>Zosterops senegalensis</i>	R	3	+						*	+	
EMBERIZIDAE											
<i>Emberiza cabanisi</i>	R	3							*		
<i>E. forbesi</i>	R	3							*		
<i>E. tahapisi</i>	AM	3							+	*	
FRINGILLIDAE											
<i>Serinus mozambicus</i>	R	4	*					+	+	+	
<i>S. gularis</i>	R	3						*			

## HABITATS

SPECIES	STATUS	ABUNDANCE	Human	Water	Marsh	Bovals	Riverine	Anogeissus	Savanna	Acacia	Grassland	AUTHORITY
PLOCEIDAE (Ploceinae)												
<i>Ploceus luteolus</i>	R	3			+		+		*	+		
<i>P. heuglini</i>	R	2					*					
<i>P. cucullatus</i>	R	4	*		+							
<i>P. melanocephalus</i>	R											
<i>P. nigricollis</i>	R	3			+		*					
<i>Malimbus rubriceps</i>	R	2							*			
<i>Quelea erythrops</i>	AM?	4			*						+	
<i>Euplectes afer</i>	R	4		+	*				+		*	
<i>E. hordeaceus</i>	R	3			*		+		+		*	
<i>E. macrourus</i>	R	3			+				*			
<i>E. orix</i>	R	4		+	*				+		*	
PLOCEIDAE (Passerinae)												
<i>Plocepasser superciliosus</i>	R	3	+						*	+	+	
<i>Passer griseus</i>	R	3	*						+			
<i>Petronia dentata</i>	AM	4							*	+		
<i>Sporopipes frontalis</i>	R?											
PLOCEIDAE (Viduinae)												
<i>Vidua macroura</i>	R	3	*						+	+	+	
<i>V. chalybeata</i>	R	2							+	*		
<i>V. orientalis</i>	AM?	2			+				*			
PLOCEIDAE (Estrildinae)												
<i>Nesocharis capistrata</i>	R	2					*					
<i>Ptilia hypogrammica</i>	AM	1										
<i>P. phoenicoptera</i>	AM	3	+						*		+	
<i>Estrilda melpoda</i>	R	4	+						+	+	*	
<i>E. caerulescens</i>	R	4	+						+	*	+	
<i>E. bengala</i>	R	4	+						+	+	*	
<i>E. larvata</i>	R	3							*			
<i>Lagonosticta rufopicta</i>	R	4	*				+		*	+	+	
<i>L. senegala</i>	R	4	*						*	+	+	
<i>L. rara</i>	R	3							+			
<i>Lonchura cucullata</i>	R	4			+				+	+	*	

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## THE BIRDS OF MAMBILLA PLATEAU

by P. Hall

Received 15 May 1976

Mambilla Plateau is an extensive area of highland between 1,500 m and 2,000 m in southern Sardauna Province of Gongola State, Nigeria. It consists mainly of rolling grassland and is extensively grazed, with remnants of forest ("kumi") along watercourses and on steep slopes. Around the big villages, Eucalyptus grandis is being planted increasingly, to replace the natural forest and to meet the growing demand for poles and fuel.

The grassland is dominated by Hyparrhenia, with Loudetia common on poorer soils. Under intensive cattle grazing and trampling, the Hyparrhenia is replaced by the tufted Sporobolus with exposed soil between the tufts, increasing run-off and eventually leading to the erosion now evident all over the Plateau. Amongst the characteristic kumi species are Syzigium guineense, Polyscias fulva, Neoboutonia sp. and Croton macrostacys.

I visited the Plateau from 13 to 22 October, 9 to 11 November, and 26 to 29 December 1974. Several species of birds not recorded by Boulter (1965), Ebbutt (1965) or Gray (1971) were seen and a total of 119 species have now been recorded on the Plateau. In the full list below, scientific nomenclature follows White (1960-65) and English names follow Mackworth-Praed & Grant (1970-73).

Ardeola ibis A small party seen near Maisamari in November. Gray saw a party of 12 in April.

Ardea melanocephala Only recorded by Gray in April.

Ciconia ciconia Two seen by Gray in April near Maisamari.

Ciconia abdimii Recorded by Ebbutt in February and by Gray in April.

Anas sparsa One in a small marsh near Yelwa in October and one near Yelwa in December. They constitute the first records of Black Ducks in Nigeria.

Gyps ruppellii Two near Ngel Nyaki Forest Reserve in October, one recorded by Gray in April at Maisamari and two or three by Boulter in December, also at Maisamari.

Gyps bengalensis One near Yelwa in December. Recorded by Boulter as common in December, by Ebbutt from both the Plateau and the Escarpment in February, and by Gray from Maisamari and Warwar.

Neophron monachus Widely but sparsely spread over the whole Plateau.

Gypohierax angolensis Two near Maisamari on 12 October and one on 21 October.

Circus macrourus One near Nguroje in November.

Terathopius ecaudatus One at the top of the Escarpment in December. One seen by Gray in April near Nguroje.

Buteo auguralis Three displaying over Gembu Forest Reserve and one near Ngel Nyaki Forest Reserve in October. Three seen near Maisamari by Gray in April.

Lophoaeetus occipitalis One between Maisamari and Nguroje in November.

Aquila rapax Two seen on the Plateau and one on the Escarpment by Ebbutt in February.

Milvus migrans Widespread in small numbers over the whole Plateau.

Elanus caeruleus Two at Yelwa in October.

Falco biarmicus One seen between Gembu and Dorofi in October. Recorded by Gray as common in April.

Falco peregrinus One near Yelwa in December.

Falco ardosiaceus A pair breeding near Gembu in December. A few recorded by Gray in April.

Falco tinnunculus Widespread in small numbers over the Plateau in December.

Sagittarius serpentarius Several recorded by Ebbutt in February and one seen near Nguroje by Gray in April.

Francolinus bicalcaratus Widespread and frequent over the whole Plateau.

Numida meleagris Three seen displaying near Ngel Nyaki Forest Reserve in October. Gray saw six near Warwar in April.

Neotis denhami Ebbutt saw two in February and Gray one in April near Nguroje.

Tringa glareola One seen at Nguroje in November.

Tringa hypoleucus Small numbers just off the Plateau in October on the River Donga near Gembu.

Gallinago gallinago One seen at Nguroje in November.

Streptopelia lugens One recorded by Ebbutt in February.

Streptopelia decipiens Widespread and frequent over the whole Plateau.

Streptopelia senegalensis Small numbers only at Yelwa in October.

Turtur afer Only recorded by Boulter (1965), in December.

Treron australis One at Yelwa in October.

Tauraco leucolophus Two in a small kurmi near Yelwa in December and two heard at Warwar in April by Gray.

Cuculus solitarius Recorded by Gray in April on the Escarpment.

Cuculus canorus One at Nguroje in October.

Centropus toulou Only seen near Gembu in dense scrub in December.

Centropus senegalensis Widespread over the whole Plateau.

Asio capensis A pair seen at Nguroje and one at Gembu in October.

Apus melba 200+ recorded by Ebbutt (1965) in February in a valley north of Gembu.

Apus caffer Small numbers seen on the Escarpment in October. Ebbutt also saw three on the Escarpment in February.

Colius striatus Widespread in small numbers in scrub over the whole Plateau. Gray also recorded it in April on the Escarpment.

Ceyx picta One seen in a small kurmi near Yelwa in December.

Halcyon leucocephala One at Nguroje in November. Boulter recorded it as common in December.

Merops nubicus One recorded by Boulter on the Escarpment.

Merops albicollis Frequent on the Escarpment in November.

Merops variegatus Seen in October at Nguroje and frequent there in tall grassy areas in November. Boulter (1965) recorded it as common in December.

Phoeniculus aterrimus One recorded on the Escarpment in April by Gray.

Pogonius bilineatus or P. subsulphureus Recorded by Gray on the Escarpment in April.

Jynx ruficollis One netted by P. Ward in a small kurmi near Yelwa, the first record for Nigeria.

Galerida cristata Two near Yelwa in December.

Riparia paludicola Frequent near Yelwa in October. Boulter recorded it as frequent in December.

Hirundo rustica A small party at Nguroje in November. Recorded by Boulter in December.

Hirundo aethiopica Widespread over the whole Plateau. Gray recorded it as common in April.

Hirundo senegalensis A few at Nguroje in October. Gray recorded five in April.

Hirundo daurica One seen on the Escarpment in November.

Delichon urbica Four seen by Gray near Nguroje in April.

Psalidoprocne nitens Recorded by Gray in April on the Escarpment.

Psalidoprocne pristoptera Small numbers seen on the Escarpment and near Ngel Nyaki Forest Reserve in October. Gray saw them on the Escarpment in April.

Motacilla flava Widespread and frequent, especially between Maisamari and Nguroje. Gray recorded them as still present in April.

Anthus novaeseelandiae One at Gembu in October. Ebbutt netted one on the Plateau in February.

Anthus trivialis One seen in a small kurmi near Yelwa in December.

Macronyx croceus Widespread and frequent over the whole Plateau.

Tchagra senegala Two at Nguroje in October.

Laniarius ferrugineus Widespread in wooded areas over the whole Plateau.

Laniarius atroflavus Not recorded on any of my three visits, but it was frequent in kurmis on Chappal Waddi, the highest mountain in Nigeria, in November.

Lanius collaris A few at Nguroje and Gembu: three recorded near Maisamari by Boulter in December.

Lanius senator Four seen by Gray in April.

Buphagus africanus Widespread and frequent over the whole Plateau.

Corvus albus Widespread in small numbers over the whole Plateau.

Pycnonotus barbatus Widespread in small numbers on wooded and thicket areas over the whole Plateau.

Chlorocichla flavigollis Small numbers present in kurmis over the whole Plateau.

Saxicola rubetra Boulter found it abundant around Maisamari in December, and Gray recorded it as still present in April.

Saxicola torquata Widespread and frequent over the whole Plateau; possibly commoner at higher elevations around Nguroje.

Oenanthe bottae Widespread and frequent over the whole Plateau in December.

Myrmecocichla nigra Widespread and frequent over the whole Plateau especially between Yelwa and Nguroje.

Cossypha niveicapilla Present in small numbers in dense thickets around Nguroje and Gembu.

Luscinia megarhynchos One caught near Nguroje in November.

Turdus pelios Frequent in Nguroje and Gembu Forest Reserves.

Schoenicola platyura One caught in dense scrub at Gembu in October.

Chloropeta natalensis Present in small numbers around Nguroje.

Sphenoeacus mentalis Present in small numbers in tall grassy areas around Nguroje and Gembu.

Sylvia borin Present in small numbers around Nguroje and Gembu on all visits.

Sylvia atricapilla One caught near Gembu in December.

Phylloscopus trochilus One caught near Nguroje in October and frequent around Nguroje by November.

Cisticola erythrops Frequent over the whole Plateau in areas of scrub.

Cisticola cantans Recorded by Gray on the Escarpment in April.

Prinia subflava Widespread in small numbers over the whole Plateau.

Prinia leucopogon Present in small numbers in woodland around Gembu.

Apalis nigriceps Recorded only by P. Ward (pers. comm.) in a kumi near Yelwa.

Hypergerus atriceps Small numbers seen near Yelwa in December.

Camaroptera brachyura Only once recorded near Yelwa, in December.

Ficedula hypoleuca One netted near Nguroje in November.

Batis orientalis One caught in scrub on the edge of Nguroje Forest Reserve in November.

Platysteira cyanea One seen near Yelwa in December.

Trochocercus longicauda One near Yelwa and one near Gembu in December. Boulter recorded it near Maisamari in December.

Nectarinia verticalis Present in small numbers around Gembu and near Yelwa.

Nectarinia preussi Widespread and frequent all over the Plateau. Boulter gave it as the commonest sunbird around Maisamari.

Nectarinia bouvieri Widespread and frequent all over the Plateau.

Nectarinia cuprea A few around Nguroje and Gembu.

Nectarinia coccinigaster One recorded by Ebbutt on the Escarpment in February.

Zosterops senegalensis Recorded only from near Yelwa, in December.

Emberiza tahapisi Frequent on the Escarpment in November. Also recorded by Boulter (1965) around Maisamari in December.

Serinus mozambicus Seen only in cultivated areas around Gembu in small numbers.

Ploceus cucullatus A large breeding colony present in Maisamari.

Ploceus nigerrimus Ebbutt recorded a small breeding colony on the Escarpment in February.

Ploceus baglafecht A few around Nguroje, Gembu and Yelwa, and netted near Nguroje. These are the first known records of this weaver in Nigeria.

Quelea erythrops Small flocks seen at Nguroje in October and November.

Euplectes ardens Widespread, but sparse, over the whole Plateau.

Euplectes capensis Widespread and common over the whole Plateau in marshy areas.

Euplectes macrourus Widespread in small numbers over the whole Plateau.

Passer griseus Widespread and frequent around all habitations.

Vidua macroura Present in small numbers in cultivated areas over the whole Plateau.

Vidua chalybeata Present in small numbers in cultivated areas around Gembu and Yelwa.

Clytospiza dybowskii Small numbers present in a kurmi near Yelwa.

Estrilda melpoda Widespread in small parties over the whole Plateau.

Estrilda nonnula Widespread in small parties over the whole Plateau.

Estrilda astrild Seen only at Nguroje in small parties. Boulter recorded it as much in evidence around Maisamari in December.

Lonchura bicolor One netted in scrub on the edge of Nguroje Forest Reserve in October.

Lonchura cucullata Present in small numbers at Gembu and Yelwa but not recorded around Nguroje.

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## FIELD IDENTIFICATION OF THE YELLOW-BILLED EGRET

by M. A. Macdonald

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Field (1975) has drawn attention to the difficulty of identifying the Yellow-billed Egret Egretta intermedia in the field, and in particular to the problem of distinguishing the Yellow-billed Egret from the Great White Heron E. alba. During early 1976 I had suspected the presence of small numbers of E. intermedia on lagoons around Cape Coast, Ghana, but had been unable to confirm the identification by comparison with other species until 23 April when two were positively identified in the company of a Little Egret E. garzetta. Since then I have had the opportunity of watching groups of up to 27 Yellow-billed Egrets (together with Little Egrets and Great White Herons) on 11 occasions involving an accumulated total of 119 individuals. These observations allow me to supplement Field's notes on their identification.

I agree with Field that confusion with the Cattle Egret Ardeola ibis (the difficulty stressed in most text-books) by anyone familiar with the commoner species is most unlikely unless only the head is visible. The points of distinction from E. alba are very subjective if comparison is not possible, but are listed below.

E. intermedia is much smaller, with thicker and less 'kinky' neck, but the size can be very difficult to estimate if a single bird is involved and in flight the difference can be quite overlooked even when both species are present. The head of intermedia has a much rounder contour than alba (especially if excited when it raises the short crest on the crown), with a more distinct forehead and lacking the angular crown of the larger bird. However, the appearance of head and neck can vary considerably in both species depending on activity and 'emotion'.

Bill size is diagnostic if it can be determined accurately, but great care must be taken to allow for the effect of parallax in 'shortening' the bill of E. alba. The bill of intermedia is absolutely shorter than that of garzetta while that of alba is absolutely longer. Bill length in both alba and intermedia varies sufficiently, however, often to make the bill of intermedia appear as long relatively as some alba. Perhaps more reliable than length alone is a combination of length and depth at the base, the smaller species having a relatively heavier bill as well as a more distinct (usually) Cattle Egret-like jowl (Fig. 1).

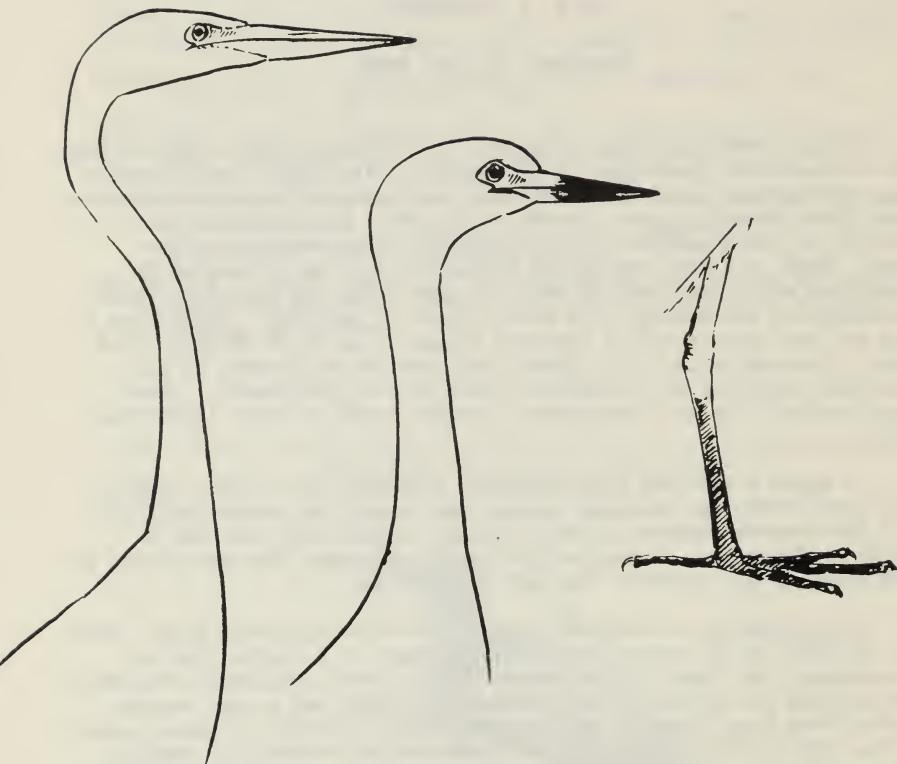


Figure 1 The head and neck of Egretta alba (left) and E. intermedia (centre) to show points of difference. The area of the beak of E. intermedia coloured red in the breeding season is shaded. Right : leg of E. intermedia, showing the extent of black in breeding condition.

Fortunately, in the breeding season (for a time at least) the problem of distinguishing the two species is eased. As breeding time approaches the bills of many E. alba show greater or lesser amounts of black. By contrast, the bill of E. intermedia turns bright red with a yellow tip and base, while the bare skin on the lores and around the eye becomes bright yellow-green. Correspondingly (but perhaps slightly in advance) the tibia and proximal end of the tarsus turn from black to straw-yellow, pink, red and finally a very deep wine-red. Although this latter change was discussed by Field (1975), the change in bill-colour does not appear to have been recorded before. During May 1976 most of the birds seen had some red on the bill, and many showed much more red than yellow. It should be noted that a small amount of yellow on the tibia is not a sure indication of intermedia, as some alba also show this feature (pers. obs.; see also Hollom 1960, Heinzel, Fitter & Parslow 1972).

To summarise, therefore, identification of the Yellow-billed Egret in the field requires care unless comparison is possible with either Great White Heron or Little Egret (when differences in size, build and bill dimensions should be detected) or unless the birds are in or approaching breeding condition (when black on the bill indicates E. alba but red on the bill or considerable amounts of yellow or red on the legs indicates E. intermedia).

The lack of accurate knowledge on the appearance of the Yellow-billed Egret has led to its being overlooked widely in West Africa. The species has been considered very rare in Ghana, but since it was seen commonly in the Cape Coast area and seven individuals were found on a visit to coastal lagoons west of Keta, it probably occurs regularly over a much wider area of Ghana (and West Africa) than at present is realised.

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## BIRDS OF MID-WEST NIGERIA

by J. B. Heigham

Received 11 March 1976

A considerable amount of information concerning birds observed in the geographical area which is now the Mid-West State of Nigeria (shortly to be re-named Bendel State) is scattered through the literature, but there exists as yet no check-list for the area. This paper tabulates the species in a form which could be used as a basis for a check-list, and is compiled from a wide but not exhaustive literature; from my wife's and my own observations during eighteen months' residence at Sapele (05° 54'N, 05° 42'E), which included travel in some other parts of the Mid-West; and from notes and comments kindly made available by J.H. Elgood (JHE), M. Insole (MI), D.N. Johnson (DNJ), C.S. Porteous (CSP), R.E. Sharland (RES), and Mrs. F.E. Warr (FEW).

D.N. Johnson is carrying out an ecological study of forest birds in an area of secondary forest on the edge of Benin City and will be publishing the results in due course. Meanwhile his systematic mist-netting is proving most productive; for example, he has obtained the first positive record for Nigeria of the Dwarf Kingfisher *Ceyx lecontei* and shown its regular presence in the forest, and he has much additional information on the status of some other species included in the Appendix.

The Area

The Mid-West State covers an area of above 49 000 km<sup>2</sup> (19 000 sq. miles) and is bounded to the north by Kwara State, to the west by Western State (that division of it shortly to become Ondo State), to the south by the Bight of Benin, and to the east by the River Niger.

The habitats vary from the hilly derived savanna of the northern parts where inselbergs abound, through areas of primary and secondary forest, intersected by many watercourses, and agricultural and plantation areas (rubber and oil-palm) lying roughly across the centre, to the swamp forest, lagoons and mangrove creeks of the Delta in the south, where also are to be found some curious enclaves of apparently old grass savanna to the east of Sapele, north of the River Ethiope.

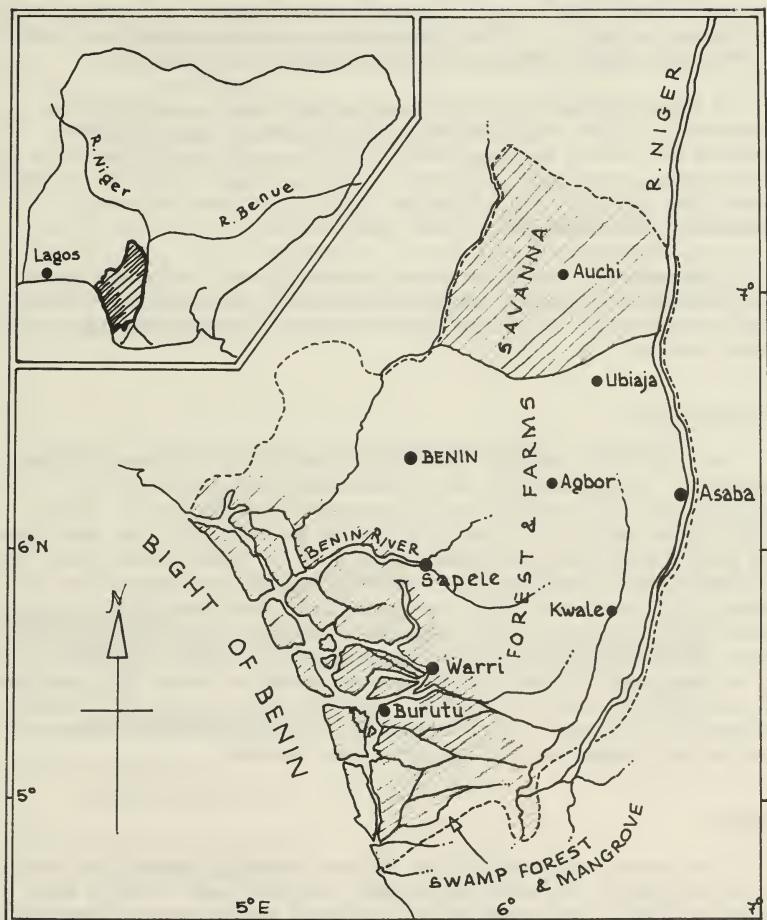


Figure 1. Mid-West Nigeria, showing the principal towns and geographical features. Inset : its location in Nigeria.

The population of the Mid-West State was estimated at 2.5 million in the 1963 Revised Census figures (it has certainly increased since then), and is broadly scattered in all areas (see main towns in Fig. 1). The creeks area, running south-east parallel with the coast line, is the least densely populated.

A major feature of present-day development - not unknown elsewhere - is the rapid decrease of the forest due to timber exploitation offset by relatively little re-afforestation, with the corresponding increase in derived savanna largely used for purposes of shifting agriculture, although there are a few large-scale agriculture developments and new plantations.

Increasing urbanisation has not yet greatly affected the major habitats but there are clear signs of, for example, forest birds (particularly sunbirds Nectariniidae) adapting to human residential areas.

#### The Bird Fauna

At least 331 species have been observed in Mid-West Nigeria (Appendix), comprising 184 non-passerines (108 genera in 34 families) and 147 passerines (78 genera in 16 families). Some records were made in the early years of the century, but most have been made since 1930 and the greater part of those since 1960. There are some curious absences of birds which might be expected to be present, for instance the White-faced Tree Duck Dendrocygna viduata, Moorhen Gallinula chloropus, Flapet Lark Mirafra rufocinnamomea, Fiscal Shrike Lanius collaris (which Marshall, 1936, seemed surprised not to have come across in the savanna areas of Ishan 40 years ago), and the Chestnut-cap Flycatcher Erythrocercus mccallii. These and other species surely occur, and show the need for more widespread observation, especially in the northern savanna.

#### Status

The status of species, so far as presently known, is indicated in the Appendix. No special attempt has been made to give mean migration dates, but some can be inferred approximately from the data under Seasonality. Some arrival and departure dates at Sapele may be of interest (Table 1).

It is difficult to reach agreement on the meaning of ordinary words signifying frequency and, in view of the varying circumstances of the observers quoted and of my wife's and my own observations, I have felt unable to adopt exactly the same criteria as any of the other authors consulted. As a general basis for our own observations I have taken a "locality" as meaning an area of 24 km (15 miles) in diameter (as in the "Birds of Nigeria Field Card"), and the terms used for frequency in any locality may be defined roughly as follows:

<u>Common</u>	not less than 20 individuals seen in the locality in the course of two hours
<u>Frequent</u>	not less than five individuals seen in the course of two hours
<u>Occasional</u>	individuals or groups seen from time to time
<u>Rare</u>	less than five sightings per year
<u>Vagrant</u>	a single sighting, not to be expected.

Where other authors have used the same terms they are quoted as in the original text but occasionally it has been necessary to interpret comments and place the observations in one of the above categories. I have abandoned the use of the term "abundant" because it seems to me too easy to misinterpret.

Table 1. Some arrival and departure dates at Sapele

	Departure	Arrival
Cattle Egret <u><i>Bubulcus ibis</i></u>	7.V.74 28.IV.75	X.74 16.X.75
Black Kite <u><i>Milvus migrans</i></u>	27.V.74 3.VI.75	24.IX.74 26.IX.75
Common Sandpiper <u><i>Tringa hypoleucus</i></u>	27.IV.74 28.IV.75	20.VIII.74 18.VII.75
White-throated Bee-eater <u><i>Merops albicollis</i></u>	6.VI.74 23.IV.75	
Swallow <u><i>Hirundo rustica</i></u>	8.V.74 6.IV.75	28.IX.74
Blue-headed Yellow Wagtail <u><i>Motacilla flava</i></u>	12.IV.74 24.IV.75	16.XI.75
Whinchat <u><i>Saxicola rubetra</i></u>	5.IV.74 15.IV.75	1.X.74

Acknowledgements

I owe a debt of thanks to those listed above who have given me the benefit of their own observations and I am very much beholden to Professor J. H. Elgood who has read the manuscript and made many constructive criticisms and suggestions of which I have made use, but I must myself take the responsibility for any omissions or inaccuracies.

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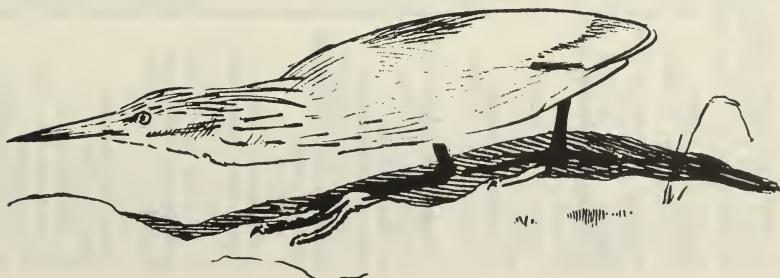
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APPENDIX - see overleaf



Sequence and nomenclature follow White ('A revised check list of African birds', 5 vols., Occ. Pap. Nat. Mus. S. Rhod. 24B & 26B and Govt. Printer, Lusaka, 1960-1965) as set out by Parker (1970), and English names follow Mackworth-Praed & Grant (1970-1973).

Status: c = common, f = frequent, o = occasional, r = rare, x = single sighting; for definitions and remarks see main body of paper; underlining indicates clear seasonal visitor.

Breeding Months in Roman numerals, evidence being eggs, nest or young; imm = immature.

Remarks Aq = aquatic, For = forest, Sav = savanna, Urb = town/village, Pla = plantation; references to Bannerman (1930-1951) and to Nigerian Field articles show volume and page, e.g. BC:266 or NF17:166.

SPECIES	STATUS (months)												BREEDING	REMARKS
	J	F	M	A	M	J	J	A	S	O	N	D		
PODicipitidae														
<i>Podiceps ruficollis</i>	f	o		o	f	f	f	f						Aq, Pla; adults and imms still present in ii as ponds dry out
PELECANIDAE														
<i>Pelecanus rufescens</i>	x		x											Aq; r in Warri area; not reported since 1968
PHALACROCORACIDAE														
<i>Phalacrocorax africanus</i>	o	o	o	o	o	o	o	o	o	o	o	o		Aq; adults and imms over Ethiope R at Sapele
<i>Anhinga rufa</i>														Aq; o in swamps in other unrecorded months (FEW)
ARDEIDAE														
<i>Ixobrychus minutus</i>														
<i>Tigrornis leucocephalus</i>	x													
<i>Nycticorax nycticorax</i>														
<i>Ardeola ralloides</i>														
<i>A. ibis</i>	f	f	f	o										For, Sav, Urb; birds feed in and around Sapele; roost in riverine For.
<i>Butorides striatus</i>	o	o	f	o	f	f	o	o	o	o	o	o		Aq
<i>Egretta alba</i>	o	o	o	o	o	o	o	o	o	o	o	o		Aq; frequently overfly Sapele
<i>E. intermedia</i>	o	o	o	o	o	o	o	o	o	o	o	o		Aq; generally with <i>E. alba</i> and <i>E. garzetta</i>
<i>E. garzetta</i>	f	f	f	f	f	o	o	o	o	o	o	o		Aq; f in creeks; o in dry season elsewhere
<i>Ardea cinerea</i>	o	o	o	o	o	o	o	o	o	o	o	o		Aq, Sav; usually single birds
<i>A. melanocephala</i>	o	o	o	o	o	o	o	o	o	o	o	o		Aq; (B8:17) considered uncommon; no recent record
<i>A. goliath</i>	x								x	x				Aq; usually single birds
<i>A. purpurea</i>														Aq; mainly in creeks (FEW); (B8:37) "Plentiful in Warri Prov."
SCOPIDAE														
<i>Scopus umbretta</i>	f	f	f	f	f	f	f	f	f	f	f	f		

vi-ix (JRH)

CICONIILDAE									
<i>Ciconia episcopus</i>	○	○	○	○	○	○	○	○	○
<i>Ibis ibis</i>	○	○	○	○	○	○	○	○	○
THERESIORNITHIDAE									
<i>Bostrychia hagedash</i>	○	○	○	○	○	○	○	○	○
ANATIDAE									
<i>Pteronetta hartlaubii</i>	○	○	○	○	○	○	○	○	○
<i>Nettapus auritus</i>	○	○	○	○	○	○	○	○	○
<i>Anas crecca</i>	○	○	○	○	○	○	○	○	○
ACCIPITRIDAE									
<i>Neophron monachus</i>	f	f	f	f	f	f	f	f	f
<i>Gypohierax angolensis</i>	f	f	f	f	f	f	f	f	f
<i>Polyboroides radiatus</i>	f	f	f	f	f	f	f	f	f
<i>Accipiter melanoleucus</i>	○	○	○	○	○	○	○	○	○
<i>A. tounseenii</i>	○	○	○	○	○	○	○	○	○
<i>A. badius</i>	○	○	○	○	○	○	○	○	○
<i>Meliaria gabar</i>	x	x	x	x	x	x	x	x	x
<i>Urotororchis macrourus</i>	x	x	x	x	x	x	x	x	x
<i>Kaupifalco monogrammicus</i>	○	○	○	○	○	○	○	○	○
<i>Buteo auguralis</i>	○	○	○	○	○	○	○	○	○
<i>Lophoetaus occipitalis</i>	○	○	○	○	○	○	○	○	○
<i>Hieraetus africanus</i>	x	x	x	x	x	x	x	x	x
<i>Haliastus vocifer</i>									
<i>Milvus migrans</i>	f	f	f	○	○	○	○	○	○
<i>Aviceda cuculoides</i>	x	x	x	x	x	x	x	x	x
<i>Elanus caeruleus</i>	○	○	○	○	○	○	○	○	○
<i>Machaeramphus alcinus</i>	○	○	○	○	○	○	○	○	○
<i>Pandion haliaetus</i>	x	x	x	x	x	x	x	x	x
FALCONIDAE									
<i>Falco biarmicus</i>	x	x	x	x	x	x	x	x	x
<i>F. peregrinus</i>	○	○	○	○	○	○	○	○	○
<i>F. subbuteo</i>	○	○	○	○	○	○	○	○	○
<i>F. cuvieri</i>									
<i>F. chicquera</i>									
<i>F. ardosiaceus</i>									
<i>F. tinunculus</i>	○	○	○	○	○	○	○	○	○

Aq; seen flying over creeks in winter months (BB:40)  
 Aq; (BB:46) not recorded since 1931.  
 Aq; For; reported by Marshall (1940) and Mason 1940; collected; no date  
 Aq; probably breeds in wet season  
 Aq; JBH  
 Aq; vagrant female JBH  
 Sav; Urb; probably call year west and north of Benin  
 Aq; For  
 For; Sav, Pla; Macdonald in Serle 1958, and JBH  
 Nest, young v  
 Nest, fledgling  
 secondary For, ii. '74  
 For  
 Sav; probably f in Sav  
 Sav  
 For; MI and JBH  
 For; Sav  
 For; Sav  
 For; Sav  
 For; Pla  
 For; one watched in a dead tree (JBH)  
 For; pair perched on tree by Benin/Lagos/road  
 Sav; Urb, Pla  
 Aq; probably more f than observations  
 Sav  
 Sav; / indicate  
 Urb; always at dusk; usually single; once  
 two; Sapele  
 Aq; (BB:86); at mouths of Dodo and Pennington Rivers 1942/3

Aq; For; Sharland (1955); at Burutu; no date  
 Aq; (BB:87); specimen collected  
 For; Urb; five singles from 24.xi to 12.iii.75  
 at Sapele, JBH  
 For; Sav; HFM May, 1935 at Ubajia (BB:90)  
 Urb; INJ in garden at Benin  
 Urb; JBH Sapele Residential Area 31.1.71  
 Sav; Urb; HFM considered F. t. tinnunculus (BB:91); seen by JBH iii and x 1974



<i>T. ochropus</i>	Aq; lagoons and pools around Sapele
<i>T. hypoleucus</i>	Aq; widespread in all kinds of Aq habitats
<i>T. totanus</i>	Aq; coastal areas and creeks
<i>T. erythropus</i>	Aq; Smith (1966)
<i>Arenaria interpres</i>	Aq; coastal areas and creeks
<i>Gallinago gallinago</i>	Aq; coastal areas and creeks
<i>Calidris canutus</i>	Aq; swampy ground at Sapele
<i>C. ferruginea</i>	Aq; coastal areas
<i>C. minuta</i>	Aq; coastal areas
<i>C. alba</i>	Aq; coastal areas
<b>GLAREOLIDAE</b>	
<i>Pluvianus aegyptius</i>	Aq; seen on Osse River; no other dates (Marshall 1940)
<i>Glareola cinerea</i>	Aq; chiefly on sandbanks; seen at Sapele iv and
<b>LARIDAE</b>	
<i>Larus fuscus</i>	Aq; noted in wider estuaries all months, MacLaren 1952, no dates
<i>Rhynopsitta flavirostris</i>	Aq; (MacLaren 1952); no other dates
<i>Anous stolidus</i>	Aq; at sea and in Dodo estuary, MacLaren (1952)
<i>Sterna tschegreni</i>	
<i>S. maxima</i>	Aq; specimen collected 22.xii.42 (B8: 227)
<i>S. hirundo</i>	Aq; (B8:230)
<i>S. fuscata</i>	Aq; (B8:227)
<i>S. nigra</i>	Aq; (B2:266) (NFI 17: 166)
<i>S. albifrons</i>	Aq; flying over Warri Port and Ethiope River at Sapele
<b>COLUMBIDAE</b>	
<i>Columba malherbi</i>	Aq; breeds on river sandbanks but no breeding record yet for Mid West
<i>Streptopelia semitorquata</i>	For; JEH
<i>S. vinacea</i>	Sav, Urb, Pla
<i>S. senegalensis</i>	Sav; probably all year in Sav in north Urb; both observations in Benin (MI and JEH), surprisingly sparse
<i>Turtur tympanistria</i>	
<i>T. afer</i>	For, Sav, Urb
<i>T. brehmieri</i>	Nest xii For; c in north west Benin (Mason 1940)
<i>Terron australis</i>	For, Sav, Urb, Pla
<b>PSITTACIDAE</b>	
<i>Psittacus erithacus</i>	Aq, For, Pla; very common in mangrove creeks (MacLaren 1952)
<b>MUSOPHAGIDAE</b>	
<i>Tauraco persa</i>	For; "well distributed" (Mason 1940); not recently observed as often as <i>T. macrorhynchus</i>
<i>T. macrorhynchus</i>	For; "Not... so common as <i>T. persa</i> " (Mason 1940); calls of species not distinguished
<i>Crinifer piscator</i>	Sav; probably all year in Sav



Aq	Aq; probably sedentary
Ceryle maxima	Aq; frequent in creeks and rivers (FEW)
C. rudis	Aq; For; also
Alcedo quadribrachys	Aq; Pla
A. cristata	For; INJ
A. leucogaster	Sav, Urb, Pla
Ceyx picta	v-x (Serie 1958 and JBH)
C. lecontei	For; INJ netted pair; seen regularly in his study area
Halcyon senegalensis	Aq, For, Sav, Urb, Pla
H. malimbica	lv-vii (Serie 1958)
H. badia	Imm 19.vii.74
H. leucocephala	Aq, Sav; JBH
MEROPIDAE	For; (Mason 1940); specimen collected; also seen by HFM Benin Province (B8: 317)
Merops malimbicus	Sav, Urb
M. albicollis	Aq, For; flock resident at Kwale all year 1931 (B8: 291); not recently recorded
M. pusillus	For; Urb
M. gularis	Sav
M. hirundineus	For, Sav
CORACIDAE	Sav; specimens collected by HFM (B8: 327)
Coracias garrulus	For?
C. cyanocaster	Burutu 1952 (Elgood et al. 1966)
Eurystomus glaucurus	r in southern provinces (B8: 303)
E. gularis	For, Sav
UPUPIDAE	Aq, For; in Gwato creek 12.xi.69 (FEW)
Phoeniculius purpureus	For; For edge near Sapele
P. bollei	For; near Nikrowa
P. castaneiceps	For; edge near Sapele and near Nikrowa
BUCEROTIDAE	Sav; probably present all year in Sav of north
Tockus nasutus	For; INJ, seen regularly in study area
T. canorus	For; INJ, seen regularly in study area
T. hartlaubi	For, Urb, Pla
T. fasciatus	For, Sav
Tropiciranus	For; "Very f" in NW Benin (Mason 1940); no dates
albocristatus	For; often seen over rivers near Sapele
Ceratogymna elata	For; "Quite numerous" in NW Benin (Mason 1940); no dates
C. atrata	For
Bycanistes fistulator	For
B. cylindricus	For





PYGONOTIDAE		Young vii, viii (JRH)	Sav, Urb, Pla; eggs viii and ix. 1949 (Serie 1958)
<i>Pycnonotus barbatus</i>	c c c c c c c c	For; INJ	For; INJ
<i>Andropadus gracilis</i>	o o o o o o o o	For; Sav	For; For edge (JRH) For; Sav; sings loud especially morning
<i>A. gracilirostris</i>	x x x x x x x x	For	For; individuals exhibit varied songs and / calls
<i>A. vires</i>	f f f f f f f f		
<i>A. latirostris</i>	o o o o o o o o		
<i>Ixonotus guttatus</i>	o o o o o o o o		
<i>Chlorocichla simplex</i>	f f f f f f f f		
<i>Thescelocichla leucopleurus</i>	f f f f f f f f		
<i>Phyllastrephus scandens</i>	x x x x x x x x	For; Urb	Aq; For; swamp palms
<i>P. baumannii</i>	o o o o o o o o	For; INJ	For; INJ seen regularly in study area
<i>P. icterinus</i>	o o o o o o o o	For; INJ	For; INJ seen regularly in study area
<i>Bleda syndactyla</i>		For; (Mason 1940) (B4:149); no dates	
<i>B. canicapilla</i>	x x x x x x x x	Aq; For; INJ	Aq; For; INJ (B8:385)
<i>Criniger barbatus</i>	x x x x x x x x	For; INJ and JRH	For; Burutu and Asaba Division (B5:445/6)
<i>C. calurus</i>	o o o o o o o o	For; INJ at Benin	and INJ at Benin
<i>Nicator chloris</i>	x x x x x x x x		
MUSCicapidae			
<i>Saxicola rubetra</i>	o o o o o o o o	feeding young iii. 1975	
<i>Myioecocha</i>	o o o o o o o o		
<i>cinnamomeiventris</i>	x x x x x x x x	For; Elgood et al. (1966)	
<i>M. albifrons</i>	o o o o o o o o	For; Mason (1940) and INJ	
<i>Phoenicurus phoenicurus</i>	x x x x x x x x	For; 'fairly common . . . all over the area'	
<i>Alethe diademata</i>	x x x x x x x x	NW Benin also Ologbo (Mason 1940)	
<i>A. poliocephala</i>		For; 'uncommon'; specimen collected (no date) Ologbo by W. A. Fairbairn (B4:412)	
<i>Stiphrornis erythrothorax</i>	x x x x x x x x	For; 'seen on 2 or 3 occasions', specimen collected, no date (Mason 1940)	
<i>Neocossyphus poensis</i>	x x x x x x x x	For; JRH and INJ	
<i>Stizorhina fraseri</i>	x x x x x x x x	For; (B4:436)	
<i>Luscinia megarhynchos</i>	c c c c c c c c	Sav Urb; most frequently seen in residential areas	
<i>Turdus pelicus</i>	c c c c c c c c	For; Nikrowa (JRH)	
<i>Trichastoma fulvescens</i>	x x x x x x x x	Aq; Pla; frequenting seasonal ponds in 1975	
<i>Acrocephalus rufescens</i>	o o o o o o o o	Sav; recorded by HFM in Kukuruku Division (B8:436); no date	
<i>Spheonoeca mentalis</i>	x x x x x x x x	Urb; JRH at Sapele	
<i>Hippolais polyglotta</i>	x x x x x x x x	Urb; RES in Elgood et al. (1966) and JRH	
<i>H. pallida</i>	x x x x x x x x		
<i>Sylvia borin</i>			

<i>S. atricapilla</i>	For; RES in Elgood et al. (1966)
<i>Phylloscopus trochilus</i>	For; Urb; JBH in Sapele and surrounding For
<i>P. sibilatrix</i>	Urb; JBH at Sapele
<i>Cisticola erythrops</i>	Sav, Urb, Pla; in parts of Sapele alongside C. galactotes
<i>C. lateralis</i>	Sav
<i>C. natalensis</i>	Imm. vi.1974 (JBH)
<i>C. brachyptera</i>	Imm. v.1974 and 1975 (JBH)
<i>Prinia subflava</i>	Imm. vi.1975 (JBH)
<i>Apalis nigriceps</i>	fledglings
<i>A. flavigularis</i>	Imm. vi.1975 (JBH)
<i>Camaroptera superciliaris</i>	Imm. vi.1975 (JBH)
<i>C. chloronota</i>	Imm. vi.1975 (JBH)
<i>C. brachyura</i>	Imm. vi.1975 (JBH)
<i>Eremomela badiceps</i>	Sav; HFM in BB:434 "One record from Kukuruku Division", no date
<i>Sylvietta virens</i>	Sav; JBH and CSP
<i>Macrosphenus concolor</i>	Sav; FEW at Warri
<i>Hyliota prasina</i>	For; JHE Sapoba 28.xii.60 (pers. comm.)
<i>Pholidornis rushiae</i>	For; JBH 13. ix.75 near Benin
<i>Muscicapa striata</i>	For; INU seen regularly in study area
<i>M. cassini</i>	For; JBH at Sapele and FEW in study area
<i>M. olivaceus</i>	Sav; at Igara in northern Sav. i.x.74; JBH
<i>M. M. comitata</i>	For, Urb; JBH
<i>Artonias fuliginosa</i>	For; Marshall (1963) and JBH
<i>Fraseria ocreata</i>	For
<i>F. cinereascens</i>	For; INU seen regularly in study area
<i>Bias musicus</i>	For; Sav
<i>Platysteira cyanea</i>	For; probably present all year in For
	Sav, Urb; probably dry season visitor only
	Ag, For; common on For streams (Marshall 1940 and Foulkes-Roberts in BB:394)
	For; INU
	For; seen 1974 and 1975 in For edge with derived Sav (JBH)
	For; JBH
	For
	Ag, For; HFM obtained specimen 1939 on Osse River (BB:396); no other date
	For; Kwale; no date (Foulkes-Roberts in BB:254)
	Ag, For, Urb, Pla; regular in Sapele residential area (JBH) and in mangroves (FEW)

<i>P. castanea</i>	For; INJ seen regularly in study area
<i>P. blissetti</i>	For; JBH near Sapele
<i>Trochocercus longicauda</i>	Aq; "Niger Delta" (B4:287); not specifically recorded but haunts mangrove
<i>T. nigromitratus</i>	For; specimen obtained (Mason 1940 and B8: 406)
<i>Terpsiphone rufiventer</i>	For; Sav; mostly <i>T. r. fagani</i> but examples seen at Warri (FEW) and Sapele (JBH) like <u>tricolor</u> Sav; "... resident in suitable localities in Benin Prov." (HFM in B6:6)
<i>Parus leucomelas</i>	Aq; "common in rivers and creeks esp. in mangroves" (FEW)
NECTARINIIDAE	For; INJ seen regularly in study area and nested
<i>Anthreptes gabonicus</i>	For, Sav
<i>A. fraseri</i>	For, Urb
<i>A. rectirostris</i>	Imm. 6.vii.75 (JBH)
<i>A. collaris</i>	For; widespread in all For areas
<i>Nectarinia olivacea</i>	For, Sav, Urb
<i>N. reichenbachii</i>	For, Sav; INJ and JBH
<i>N. cyanolaema</i>	Aq, Sav, Urb; regularly seen in Warri (FEW)
<i>N. fuliginosa</i>	Aq, For, Urb
<i>N. adelberti</i>	eggs xii.68 (FEW) Imm. ii, iv, vi (JBH)
<i>N. venusta</i>	iv, vi, vii (JBH)
<i>N. chloropygia</i>	Ur; "r in For" (B6:182); no date; DNJ in garden at Benin, netted ix. 1975
<i>N. cuprea</i>	For, Sav, Urb, Pia
<i>N. superba</i>	nestlings 11.vii.74; Copulation (DNJ) 23.viii.74
ZOSTEROPIDAE	Sav; JBH in northern Sav and enclave east of Sapele
<i>Zosterops senegalensis</i>	Sav; noted by HFM at Auchi (B6:302); no date
EMBERIZIDAE	Sav, Urb; "Benin Province, north of For" (HFM in B6:278); "throughout year in Warri" (FEW)
<i>Emberiza cabanisi</i>	Aq, Sav; at Ishan and Asaba (HFM in B7:156)
FRINGILLIDAE	Building nests (B7:157)
<i>Serinus mozambicus</i>	eggs ii.44 (B7:123)
PLOCEIDAE	f
<i>Ambyospiza albifrons</i>	0 0
<i>Ploceus aurantius</i>	f

<i>P. cucullatus</i>	c c c c c c c c c c c c	Males build nests all year. Imm. v-vii. Nests rainy season, over water	For, Sav, Urb; FEW and JBH
<i>P. nigrerrimus</i>	c c c c c c c c c c c c	Sav; HFM observed in Jan. Igarra; no date (B7:98)	
<i>P. superciliosus</i>	x x x x x x x x x x x x	For, DNJ and JBH	
<i>P. tricolor</i>	o o o o o o o o o o o o	Sav, Urb, Pla; eggs xii. 50 (1958)	
<i>P. nigricollis</i>	o o o o o o o o o o o o	viii. 51 (Serie 1958)	
<i>Malimbus scutatus</i>	o o f f f f f f f f f f	Nest building Warru 16.iii.68 (FEW)	For Sav; egg 6. v. 49 (Serie 1958)
<i>M. nitens</i>	o o o o o o o o o o o o	iv and v (HFM in B7:136)	Aq, For
<i>M. rubricollis</i>	o o o o o o o o o o o o	Nests vi. 68. (FEW) Imm. vii. 74-1.75 (JBH)	For, uncommon near Sapele
<i>M. malimbicus</i>	o o o o o o o o o o o o	Nest building Sapele 28.vi.75	For, DNJ; seen regularly
<i>Quelea erythrops</i>	o o f c c	Warru 16.iii.68 (FEW)	Aq, Sav; FEW and JBH; flock
<i>Euplectes hordeaceus</i>	o o o o o o o o o o o o	Breeding dress vi-vii	Sav, HFM Ishan, Benin Prov (B7.175)
<i>E. macrourus</i>	o o o o o o o o o o o o	Imm. 28.i.75	Sav; CSP and JBH
<i>Passer griseus</i>	c c c c c c c c c c c c	Breeding dress iv-x	Urb
<i>Vidua macroura</i>	f f f f f f f f f f f f	carrying material vi and ix (FEW)	Sav, flocks up to 100 not dry season
<i>V. chalybeata</i>	x x x x x x x x x x x x	Nest in garden vi to ix	Urb; in Warru (FEW)
<i>Pirenneses ostrinurus</i>	o o o o o o o o o o o o	Nest 16.iii.75	For, Sav
<i>Nigritta canicapilla</i>	c c c c c c c c c c c c	carrying material vi and ix (FEW)	For, DNJ and JBH
<i>N. luteifrons</i>	x x x x x x x x x x x x	Nest in garden vi to ix	For, Urb; 10. ix. 74 pair in 10. vi. 75 male in For (JBH)
<i>N. bicolor</i>	o o o o o o o o o o o o	Nest in garden vi to ix	For, Urb; nest abandoned by
<i>N. fusconota</i>	o o o o o o o o o o o o	Eggs 2. ix. 49 (Serie 1958)	For, DNJ and JBH
<i>Spermophaga haematina</i>	f f f f c c c c f f f f	Eggs 2. ix. 49 (Serie 1958)	For, Urb, resident at Sapele area (JBH)
<i>Estrilda melpoda</i>	o o o o o o o o o o o o	Feeding young 20. vi. 75	Sav, Urb, Pla; JBH
<i>Lonchura bicolor</i>	c c c c c c c c c c c c	Eggs 9. vi. 49 (Serie 1958)	Sav, Pla
<i>L. caudulata</i>	c c c c c c c c c c c c	Eggs iv. 74 (Serie 1958)	Sav, Urb, Pla; imm. seen all

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The vignettes on pp. 48, 72 and 81 portray a Collared Flycatcher,  
Bouvier's Sunbird and Squacco Heron



